

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

WHERE ARE THE RISK TAKERS?
USING THE ENTREPRENEURIAL ORIENTATION CONSTRUCT TO IDENTIFY
INNOVATIVE AND PROACTIVE TEACHERS

A dissertation submitted in partial fulfillment of the requirements
For the Doctor of Education Degree in Educational Leadership

by

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Abstract

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Entrepreneurs in education have altered the services and the delivery of services that the public expects to receive from traditional school systems. Many current innovations require teachers to be more entrepreneurial. Research indicates that entrepreneurial characteristics that contribute to success in other professions may predict success for entrepreneurs in education. Yet, most personality profiles of teachers reveal they do not share entrepreneurs' risk taking propensities. Thus, promising educational innovations may not be realized because there are insufficient numbers of entrepreneurial teachers to implement them. This quantitative study of 729 California teachers adapted an Entrepreneurial Orientation instrument, widely used in management research, to determine whether teachers in charter, traditional public, and private schools differ along scales of innovativeness, proactiveness, and risk taking. Data from this sample revealed non-significant differences in innovativeness; significantly higher scores among traditional public school teachers and female teachers in proactiveness.

Chapter I: Statement of the Problem

This inquiry examined the entrepreneurial orientation constructs of teachers. The goals of the study were to (a) develop an instrument that measured the entrepreneurial orientation (EO) of teachers; (b) validate the consistency and reliability of the teacher EO instrument; (c) report the distribution of entrepreneurial teachers among charter, private, and traditional public school teachers, and (d) provide a rationale for using EO in education.

The education market in the United States is currently made up of 50 million K-12 students dispersed among 50 states (Childress, 2010). Because of local control, this market is fragmented and it has not been easy for educational entrepreneurs to introduce new products into over 100,000 individual schools governed by 15,000 separate districts (Childress, 2010). The average school district in the United States spends over \$10,000 per student annually (Hill & Roza, 2010). In 2010, total expenditures by public school systems in the United States topped \$602.6 billion (Wilson, 2010). An additional \$2 billion is also spent on education philanthropy (Childress, 2010). Approximately 80% of all public education dollars are allocated to salaries and benefits of school personnel (Childress, 2010). Most of the entrepreneurial activity in public education is centered on eliminating achievement gaps (Childress, 2010). This activity focuses on three areas: (a) creating new pools of talent, (b) developing effective performance tools, and (c) launching and growing new schools.

Despite these formidable challenges, entrepreneurs in education have increased efforts to systemically change public education. Recently, many promising innovations have overcome traditional barriers to entry and altered the services and the delivery of

services that the public expects to receive from traditional school systems. For example, Rocketship Education is changing the way elementary education is delivered with a blended learning model that uses rigorous curriculum to reduce the achievement gap in low-income areas (Schorr & McGriff, 2012). School of One uses a learning algorithm to customize daily individual education plans for each student (Quillen, 2011). Teach for America has created an innovative teacher training and credentialing program for top-tier candidates committed to serving in low-income schools (Heineke, Carter, Desimone, & Cameron, 2010)

Edusoft helps teachers track and analyze formative assessments (Smith & Petersen, 2006). Carnegie Learning has created blended mathematics programs that are used by over 275,000 students across the country (Smith & Petersen, 2006). These examples involve former educators who have founded businesses that have changed school systems from the outside (Smith & Petersen, 2006). Other examples of entrepreneurship in education involve people who work within the system, but attempt to change it significantly. In this manner, Los Angeles Unified School District's (LAUSD) Public School Choice Initiative (PSC) may restructure more than 250 persistently low-performing schools, affecting over 300,000 students over the next three years (LAUSD, 2010).

As momentum for large-scale institutional change in education builds, perhaps educational leaders should examine the entrepreneurial orientations of the teachers who will shoulder most of the work in implementing new programs? Research may find that teachers who have an entrepreneurial affect are better suited to implement innovative programs. Smith and Peterson (2006) define the education entrepreneur as a “rare breed

of innovator whose characteristics and activities may lead to the transformation, not merely the slight improvement, of the public education system” (p. 2).

These types of teachers and other education entrepreneurs introduce what Christensen (1997) called “disruptive innovations” into the market. Smith and Petersen (2008) described disruptive innovators as those that break with current practice to serve a new population of customers and create entirely new architectures and ecosystems. By creating innovations that improve a product or service in ways that the traditional education market does not expect, educational entrepreneurs can become change agents that permanently transform public education. School systems are forced to respond to these innovations by incorporating versions of them into their programs or else risk marginalization in the education market.

For instance, in 1990, Teach for America (TFA) placed 500 teachers in five low-income communities around the country (Childress, 2010); and in 2012, more than 9,000 corps members were teaching in 43 urban and rural regions across the United States (Neale, 2012). Between 1990-2010, TFA trained and placed more than 24,000 high-achieving college graduates as teachers throughout the United States (Higgins, Hess, Weiner & Robison, 2011). These TFA corps members came from the 350 top universities in the United States and had an undergraduate grade point average of 3.6. Thus, school districts may prefer TFA candidates to traditional teacher college candidates who generally have lower GPAs (Tucker, 2011). However, the examination of the entrepreneurial affect of teachers may be a more appropriate unit of measurement than GPA since it covers dimensions necessary for persistence.

Schumpeter first defined the entrepreneur as an innovator (Hebert & Link, 2006). He noted “the carrying out of new combinations we call ‘enterprise,’ the individuals whose function it is to carry them out we call ‘entrepreneurs’” (Schumpeter, 1934, p. 74). Hess (2006) clarified the educational entrepreneur as one who “seeks to teach children who have been ill served, improve the quality of teachers and school leaders, give educators more effective tools, and deliver services in more useful and accessible ways” (p. 2). Leisey and Lavaroni (2000) used the term “edupreneur” to describe “a person within a school organization who takes hands-on responsibility in creating, developing, and marketing a program, product, service or technology for the enhancement of learning consistent with the stated goals of and supported by that organization” (p. 51). As school reform has received renewed attention from the Federal government, barriers to entrepreneurs in education appear to be subsiding. Yet there remains minimal examination of the entrepreneurial orientations of teachers who make up the largest number of employees in the education sector.

This study acknowledged the importance of “intrapreneurs.” The term intrapreneur was developed in the mid-1970s by substituting the term “intra” meaning within, for (entre)+preneur. The term came to mean “an employee of a large corporation who is given freedom and financial support to create new products, services, systems, etc., and does not have to follow the corporation's usual routines or protocols” (Collins English Dictionary, 2011). Levin (2006) simplified intrapreneurship in the education context as “the quest to transform an existing school” (p. 165). To date, the research on how intrapreneurship occurs in education is scarce. The example of LAUSD’s PSC resolution shows how intrapreneurs compete against educational entrepreneurs from

outside a system. As the initiative now relies solely on the power of intrapreneurs to implement reform, questions should arise about the entrepreneurial nature of teachers opening new schools of choice. Will they be rewarded for being innovative, or punished for being proactive? Will intrapreneurs in LAUSD be encouraged or discouraged to take risks and compete aggressively against factions in the district who wish to retain the status quo? Additional study is needed to shed light on how intrapreneurship delivers innovations to the education sector. A closer examination of intrapreneurs and their role as change agents was outside the scope of this study.

Drucker (2007) postulated that innovation and entrepreneurship are practices that use existing knowledge bases to create purposeful tasks that can be organized as systematic work. Thus, the work of an edupreneur should be part of an educator's normal every day routine. Further, classroom teachers, who work with students daily, are in a position to ascertain which strategies are working and which are not. Consequently, there should be fewer roadblocks for the implementation of innovative ideas. Unfortunately, this is not always the case in urban schools where veteran teachers become "hardened change survivors" (Duck, 2006, p. 112) and do not readily adopt their district's "sense of urgency" which Kotter (2006) described as an inevitable characteristic when experiencing failed organizational change. Some educational researchers and policy makers advocating entrepreneurial policies might reconsider the likelihood of creating institutional change within the public school system without adequate information on the supply of entrepreneurial teachers.

A vast body of literature examines the characteristics of successful entrepreneurs in business, yet only one study has been conducted to develop an entrepreneurial

inventory for public schools. Eyal and Inbar (2003) developed a public school entrepreneurial inventory (PSEI) for measuring organizational entrepreneurship in a centralized system. No published study has attempted to study different populations of teachers along a multi-dimensional scale of entrepreneurial orientation.

Lessons learned from the literature on entrepreneurial leadership within business may be cross applied with research on the personality constructs of teachers to reveal new approaches in educational problem-solving and decision-making. The present study examined the entrepreneurial self-perception of teachers at different types of schools. Teachers were chosen as the focus of the study because they are analogous to middle managers in business wherein they directly supervise or “manage” between 20-220 students or “employees” on a daily basis.

Problem Statement

Currently, educational researchers have not begun classifying the entrepreneurial aptitudes of teachers. As the number of choice schools and innovative programs increase in public education, there are considerable questions as to whether there will be enough teachers with entrepreneurial affect to staff, support, and sustain these schools and their innovations. There are a wide variety of school choices. For example, charter school types, “independent” charters versus “affiliate” charters, and schools run by large “Charter Management Organizations” (CMOs) versus “mom and pop” charter schools. There are similar differences in private schools between “parochial” versus “independent.” For the purposes of this study, these groups have been condensed into a primary category, “charter” or “private,” as the researcher did not collect names or identifiers of participating schools.

A portfolio-management model involves districts choosing from a diverse set of providers to operate schools and apply strong accountability processes to measure performance (Bulkley, 2010). This enables districts to close lower performing schools and expand the operations of higher performing schools. Hill and Campbell (2011) stated the number of districts employing portfolio-management strategies has increased nationally from four in 2008 to 24 in 2011.

Nationally, in 2011, 13 states enacted school choice legislation and 28 states had choice legislation pending (Martin, 2011). The present study created an instrument to measure the entrepreneurial orientation of teachers and reported the differences between sub-categories of teachers. This knowledge may help districts utilizing the portfolio management model and opening new start up schools to learn how to engage teachers as active partners in sustaining innovation and institutionalizing improvements within the architecture of current systems. Reporting on the entrepreneurial orientation constructs of teachers contributes to filling a void in the current literature. Policy makers may benefit from being able to identify entrepreneurial teachers and gain insight on how to increase incentives for entrepreneurial teachers to open new, innovative schools.

Considerable research (Covin & Slevin, 1986; McClelland, 1961; Miner, 1993; Peters & Waterman, 1982) has been conducted on entrepreneurial personality traits in the corporate world. However, this work has resulted in mixed findings and there is difficulty in claiming that one construct significantly captures all the characteristics of an entrepreneur. The absence of research applying the entrepreneurial orientation construct in the education environment makes it problematic to claim that one entrepreneurial characteristic has more significance than another. At present, educational researchers

have found no clear way to classify teachers' entrepreneurial aptitudes.

Purpose and Significance

A purpose of this study was to investigate whether there are differences in the entrepreneurial orientation constructs of teachers in different types of schools. Covin and Lumpkin (2011) reported that the concept of Entrepreneurial Orientation (EO) has been referenced in 256 scholarly journal articles. Further, interest in EO appears to be growing as 109 of these 256 articles were published between January 2008 and December 2010. A ProQuest search of dissertations and theses yielded 44 results when searching abstracts containing the terms "entrepreneurial orientation construct" between 1987- 2011.

Lumpkin and Dess (1996) affirmed that entrepreneurial orientation refers to the "processes, practices, and decision-making activities that lead to new entry" (p. 136). Further, autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness are present when a firm engages in new entry. Thus, these dimensions characterize an entrepreneurial orientation and need not strongly or positively covary for the existence of a construct to be claimed. Finally, "research to refine measures, explore the underlying processes associated with entrepreneurial activity, and recognize the multidimensional nature of entrepreneurial behavior also will enhance our understanding of EO and its relationship to organizational performance" (p. 165).

In the education context, smaller schools have fewer administrators and need teachers who can work with minimal supervision and less intervention from management (Nadelstern, 2012). Most new charter and private schools start typically small (Gross, Fruchter, & Simmons, 2012). Many open with only one or two grade levels and demonstrate promise before scaling up and adding additional students (Hemphill, Nauer,

Zelon, & Jacobs, 2009). Incorporating EO research into education may reveal whether or not there are benefits to teachers staffing new schools being competitive risk takers who can innovate.

Research Questions

The fundamental research question in the study asked: Do the entrepreneurial orientations of teachers in charter, private, and traditional public schools differ along constructs of innovativeness, proactiveness, and risk taking? Subquestions investigated: (a) What is the distribution of entrepreneurial characteristics among teachers at different school levels (elementary, middle, high school)? (b) Which entrepreneurial characteristics are most frequently self-reported by teachers? (c) Is one subgroup of teachers more disposed to innovativeness, proactiveness, or risk taking than others?

These research questions were transformed into hypotheses for empirical testing purposes. The study theorized that (H₁) The entrepreneurial orientations of teachers in charter, private, and traditional public schools will differ along constructs of innovativeness, proactiveness, and risk taking. Additional hypotheses were: (H₂) The distribution of entrepreneurial characteristics among teachers will vary at different levels of schools. (H₃) Certain entrepreneurial characteristics will be more frequently self-reported by teachers. (H₄) One subgroup of teachers is more disposed to innovativeness, proactiveness, and risk taking than others.

Developing an instrument to measure the entrepreneurial orientation of teachers may provide researchers and policy makers with a tool that can predict success for educational start-ups. Subsequent researchers may investigate: What are the entrepreneurial orientations of teachers creating innovative schools? What implications

do entrepreneurial characteristics or a lack thereof have on establishing schools that may bring disruptive innovation or creative destruction to a low performing district? Which entrepreneurial characteristics seem to be the most important for teachers opening up innovative schools of choice or managers overseeing portfolio-managed schools? Do teachers who score highly on an entrepreneurial orientation construct also have high value added scores when correlated with student achievement? The benefits of using EO as a lens to study teachers are numerous and significant.

Theoretical Framework

Mars & Rios-Aguilar (2010) believed it essential to “define the conceptual and theoretical boundaries of entrepreneurship as an analytical framework in order to strengthen its contributions to higher education scholarship” (p. 457). This inquiry built on the work of Eyal and Inbar (2003) who demonstrated a two-dimensional model of school entrepreneurship. This study attempted to adapt the scaled instrument used by Lumpkin and colleagues (Lumpkin, Cogliser, & Schneider, 2009; Lumpkin & Dess, 1996; Lyon, Lumpkin, & Dess, 2000) to broaden the model into a five-dimensional construct, which evaluated the entrepreneurial performance of organizations along a continuum with tests for autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness. Unfortunately, the dimensions of autonomy and competitive aggressiveness did not validate during pilot testing and were excluded from this study.

The entrepreneurial orientation construct has been rigorously tested over the last 30 years, however, since this instrument had never been used on teachers in educational research, the investigator collected a large sample (N=729) and conducted exploratory factor analysis to confirm the reliability of the scaled instrument in evaluating the

entrepreneurial orientations of teachers.

Overview of Methodology

This quantitative study used an entrepreneurial orientation instrument, which was an 18-item Likert-type scaled survey that measured teachers' individual values along three constructs: (a) innovativeness, (b) proactiveness, and (c) risk taking. Multiple regression and analysis of variance (ANOVA) were conducted on a population of 729 teachers from charter, private, and traditional public schools in California. Exploratory factor analysis analyzed intercorrelations between the measures of innovativeness, proactiveness, and risk taking. These variables are displayed in factor loadings Table 3.5.

Delimitations

As defined by Mauch and Birch (1993), delimitations are factors that may affect the study, but are "controlled by the researcher." This study of 729 charter, private, and traditional public school teachers was conducted in February of 2013 in California. This study used random sampling and an email marketing program to solicit 9,836 educational leaders in California. An email request asked principals interested in participating in the study to forward a link to an online questionnaire to their teachers. It was sent to 681 charter school principals, 1,388 private school principals, and 7,767 traditional public school principals. Data was collected anonymously. There is no way to know which schools participated. To avoid any potential conflict of interest, schools within the Los Angeles Unified School District, the principal investigator's employer, were excluded from the study. A respondent sample of 729 teachers was downloaded for analysis on Tuesday, February 26, 2013. This revealed that 708 surveys were thoroughly completed, resulting in a survey completion rate of 97.1%.

Limitations

A limitation is defined as “a factor that may or will affect the study in an important way, but is not under control of the researcher” (Roberts, 2012, p. 139). This study used the EO construct, a scaled survey instrument that has been the focus of 30 years of research. However, this instrument was designed to measure the entrepreneurial orientation of businesses and compare the differences in entrepreneurial attitudes of firms competing in the same market. There was no evidence in the literature of researchers attempting to adapt and validate this instrument for use in evaluating the entrepreneurial attitudes of teachers. Since the intent of the original instrument was to compare the entrepreneurial orientation constructs of for-profit corporations within a marketplace, there were questions about its appropriateness for measuring the entrepreneurial affects of teachers.

As this study was conducted in California, it is questionable as to whether the findings are generalizable, or predictive of a national sample of teachers. Using grounded theory development, this study administered an 18-item Likert-type scaled survey to 218 charter school teachers, 148 private school teachers, and 342 traditional public school teachers, resulting in a sample of 708 teachers. Statistical averaging was conducted in SPSS to increase the size of the sample to 729 respondents. The rationale for doing this work was quite simple; when evaluating market theory programs in education, especially when evaluating the sustainability of portfolio models of school reform, researchers should utilize the tools that businesses use to evaluate and predict competitive market conditions.

Choice requires competition to provide students with equitable educational experiences. Entrepreneurial values on competition, however, may clash with traditional educational views on equity and access. Researchers who do not believe that the market model has validity in the education arena may find this line of reasoning unsatisfying. Another limitation is that teachers' scores on the EO instrument in this study are self-reported. Participants interpreted the items and rated themselves. There may be a need for follow-up observational studies of teachers' EO to determine if the findings of this study are valid. Further, there may be additional factors outside the realms of innovativeness, proactiveness, and risk taking that contribute to differences in teachers in entrepreneurial settings, however, those factors were outside the scope of this study and such variances remained unaccounted for and unmeasured.

Organization of Dissertation

This study adapted an instrument to measure the entrepreneurial orientation constructs of teachers in California. A second goal of the study was to report the distribution of entrepreneurial teachers in charter, private, and traditional public schools. A third goal of the study was to validate a Teacher Entrepreneurial Orientation (TEO) instrument so that additional researchers could increase the scope of inquiry into teacher entrepreneurial affect. Chapter 2 will review literature on innovation in education, the personality characteristics of entrepreneurs and teachers, school choice, portfolio management models of school reform, and teacher leadership. Finally, the literature review will examine the use of the entrepreneurial orientation construct in corporate sectors and conclude with a look at recent dissertations using entrepreneurial orientation instruments in new dimensions.

Chapter 3 will elaborate on the methods for addressing the research questions in this study. It will describe the sample selection, instrument pilot testing, and data collection procedures. The rationale for analyzing the quantitative data with exploratory factor analysis, multiple regression analysis, and ANOVA testing will be articulated.

Chapter 4 will report the results of this study. It will describe the sample by providing means tables and standard deviations on the EO dimensions. Then it will outline the analyses conducted on the data. Lastly, it will report answers for the research questions in statistical form using tables, figures, and narrative.

Chapter 5 will provide detailed interpretation, analysis, and synthesis of the results. An in-depth discussion of the results, conclusions, implications for practice, and recommendations for future research will conclude the dissertation.

Chapter II: Literature Review

This study examined the entrepreneurial orientation constructs of California teachers. To do this, it was necessary to review the literature on teacher leadership, teachers and job satisfaction, innovation in education, personality characteristics of entrepreneurs and teachers, entrepreneurial attitudes in education, and provide an overview of the entrepreneurial orientation construct, including debate as to whether EO is an dispositional or behavioral phenomenon, theoretical lenses used in EO and current trends in EO research.

While the primary goal of this study was to develop an instrument to measure the entrepreneurial orientation of teachers, the fundamental research question in the study examined whether the entrepreneurial orientations of teachers in charter, private, and traditional public schools differ along constructs of innovativeness, proactiveness, and risk taking. Subquestions investigated: (a) What is the distribution of entrepreneurial characteristics among teachers at different school levels (elementary, middle, high school)? (b) Which entrepreneurial characteristics are most frequently self-reported by teachers? (c) Is one subgroup of teachers more disposed to innovativeness, proactiveness, or risk taking than others?

Evolution and Organization of Literature Review

This literature review evolved in its scope and sequence over two years. First, the researcher spent a year participating in LAUSD's Public School Choice process, leading a team in writing a proposal to open a school of choice, getting approved by the superintendent and school board, and then opening and operating a school of choice after the first round of the competition. Next, the investigator studied Public School Choice as

a phenomenon in Los Angeles and conducted a semester-long, qualitative case study on the PSC process at a LAUSD high school. A subsequent semester involved examining the entrepreneurial literature from the corporate sector as a lens for measuring the levels of innovation within Public School Choice. In August of 2011, LAUSD amended their 2009 Public School Choice Resolution to give preference to teams of internal candidates over external candidates from charter operators and community organizations (LAUSD, 2011). Both the Associated Press and Education Week suggested this might limit the initiative's capacity to "create change or increase educational options for LAUSD students" (Marsh, Strunk, & Bush, 2011, p. 53). As a result, this dissertation was modified in scope and the literature review broadened to encompass additional elements of educational entrepreneurship, constructing and validating psychometric scaled instruments.

The review of literature for this study involved studying entrepreneurship, which led to scrutiny of the methods where entrepreneurial orientation constructs have been used to measure the EO of firms within various corporate sectors. A gap in the literature was noted wherein most studies have used EO to measure corporate performance, providing an opportunity for educational researchers to conduct inquiry into the entrepreneurial orientations of workers in the public sector.

Additional investigation into the validation of scaled instruments lead to the discovery of methods available to adapt the EO construct and increase its reliability for use in schools. Next, an overview of existing education entrepreneurs (Childress, 2010; Hess, 2006, 2008) led the researcher to arrive at a theory for additional exploration: If the supply of entrepreneurial educational leaders is not sufficient to overcome

implementation hurdles, innovative plans may fail to have any lasting transformative effect. After phone consultations with Dr. Tom Lumpkin and Dr. Bill Wales, published leaders in the field of EO, the investigator was encouraged to adapt an instrument to measure EO in teachers.

Teacher Leadership

Teacher leadership has been subject to widespread focus in recent years (Crowther, Ferguson, & Hann, 2009; Darling-Hammond, 2000; Farris-Berg, Dirkswager, & Junge, 2013; Markow, Macia, & Lee 2012; Schmoker, 2011). Teachers are widely acknowledged as the most important school-related factor influencing 33% of student achievement (Markow et al., 2012). Principals are necessary in creating a culture where teachers and students can succeed. Research has shown that an effective principal accounts for 25% of a whole school's impact on student achievement gains (Markow et al., 2012).

Darling-Hammond (2000) found that teacher quality related to improvements in student performance. Measures of teacher preparation and certification were the strongest correlates of student achievement, both before and after controlling for student poverty and language status. Crowther et al. (2009) wrote that teachers can and do lead across schools, raising the performance of their own institutions. However, teacher leadership has become so data-driven that long-term reflection has been replaced by the pressure to meet short-term targets. Thus, true teacher leadership needs to be restored through conversation, inquiry, and action to transform curriculum and pedagogy.

Farris-Berg et al. (2013) posit that teachers could be the social entrepreneurs we need for K-12. Teacher partnerships design stunningly different approaches to teaching

and learning. They also create management cultures that emulate those of high-performing organizations. This research suggested that examining teachers as leaders and managers was an appropriate line of reasoning. Further, investigating the distribution of entrepreneurial factors among different populations of teachers may lead to a breakthrough in identifying characteristics predictive of success in nascent educational ventures.

Teachers and Job Satisfaction

Sachau (2007) called for a resurrection of Herzberg's theory of motivation. Herzberg (1966) challenged basic assumptions about what satisfies and motivates employees by claiming that pay contributes little to job satisfaction. Sachau (2007) argued that the goals of positive psychologists are consistent with the goals of most human resource professionals: enhancing skills, elevating satisfaction, improving performance, and fostering creativity. This aligns with portfolio management researchers Hill, Jochim, and Campbell (2013) who advocated that "capable people must be eager to start good new schools; schools newly free to manage themselves must be able to attract good teachers and leaders, and get help improving their practices" (p. 4).

Carruthers (2012) found less qualified and less effective teachers move to charter schools, particularly when they move to urban schools, low-performing schools, or schools with higher proportions of nonwhite students. This suggests that the charter movement's inability to recruit teachers who are at least as effective as those in traditional public schools may harm charter student achievement. Payne (2013) argued that charter school autonomy has failed to produce innovation or improve student achievement, and that "the evidence on charter school teacher turnover and lack of job

security may explain some of the lack of difference in student achievement between charter schools and traditional public schools” (p. 22).

Ingersoll (2001) found private school teachers express less dissatisfaction than do their public school counterparts. Ballou and Podgursky (1998) suggested that private schools were more successful than public schools in retaining the best of their new teachers and in developing the teaching skills of their faculties. Contributing factors in this phenomenon were greater flexibility in structuring pay, more supervision and mentoring of new teachers, and the freedom to dismiss teachers for poor performance. Pomson (2005) also noted that as day-school (private school) teachers reflect on their professional lives, they indicate there are features in the language, culture and community of private schools, which compensate for material benefits (less pay) and make them highly satisfying places to work.

Public school teacher job satisfaction has been the focus of recent debate. There is considerable debate within the education community over the status of teacher job satisfaction. Feistritz et al. (2011) reported overall public school teacher job satisfaction is now higher than ever at 89%, six points higher than the low of 83% recorded in 1990. Conversely, a MetLife study in 2012 announced that public school teacher satisfaction had declined 23 percentage points since 2008, from 62% to 39%, to the lowest level in 25 years (Markow et al., 2012).

Innovation in Education

Many policy makers see innovation as a discipline and lever for change in public education. Entrepreneurs in education have been investigated by numerous researchers: (Childress, 2010; Hess, 2006, 2008, 2010; Lake, 2008; Lubienski, 2003, 2009). There is

wide interest in the educator as innovator. Smith and Peterson (2011a) maintained innovation happens in the public sector “when visionary people try to do things differently, despite being surrounded by people doing things the way they always have” (p. 1).

John Bailey (2010), a member of the U.S. Department of Education's Commission on the Future of Higher Education, testified “it isn't that there is a shortage of ideas or entrepreneurs in the education sector, it is that the tangled web of regulations, entrenched bureaucracies, and outdated policies [makes] it difficult for any of these innovations to be adopted by traditional schools stuck in their traditional system.” Hassel (2008) claimed education is not a hospitable place for entrepreneurs and too few enterprising, talented people choose to go into education (p. 64).

Compound these issues with California's increasingly veteran teacher workforce and a relatively inexperienced corps of principals (Bland et al., 2011) and the results will likely be additional barriers to teacher entrepreneurship. Smith and Peterson (2011b) argued that voters and policy makers should characterize educational stakeholders as those who support risk taking in the interest of student achievement versus those who favor continued mediocrity. This work underscores a sense of urgency when calling for education entrepreneurs to change the system.

This study also considered the importance of intrapreneurs like Spencer Silver and Art Fry of 3M who created the Post-it in 1980; Ken Kutaragi of Sony Sound Labs, who invented the PlayStation in 1994; Dave Myers and John Spencer who applied Gore-Tex coating for rain gear to guitar strings, creating Elixir Strings in 1997, which has become the number one seller of acoustic guitar strings in the world (Swearingen

&Bergfeld, 2008). These innovations suggest that large organizations should encourage their rank and file employees to innovate. In education, this job most likely falls to a teacher, who may see opportunities to deliver instruction in ways that aren't being considered by an over-burdened administrator or distant central office.

Personality Characteristics of Entrepreneurs

Researchers (Covin & Slevin, 1986; Peters & Waterman, 1982) argued that entrepreneurship is an essential feature of high-performing firms. A driving force of entrepreneurial creation includes an independent spirit and the freedom of action necessary to advance new venture development (Burgelman & Doz, 2001). Entrepreneurs are predisposed to having a high need for achievement (McClelland, 1961; Miner, 1993). Despite an abundance of research on entrepreneurship in the corporate sector, there remains little inquiry into entrepreneurship in the public sector.

Mars and Rios-Aguilar (2010) found “little to no attention has been given to conceptual and theoretical boundaries of entrepreneurship within higher education literature” (p. 442). This work suggests that findings from entrepreneurial studies in the private sector should be replicated within the public sector. Clearly, if these findings are confirmed as valid for entrepreneurs in education, then a step toward causality will have been made, which will warrant further exploration into the theory that entrepreneurial teachers may be an essential ingredient for improving schools.

Krueger (1998) sought to identify the primary tendencies of small business owners using a DISC assessment from Marston (1979) which identified: (a) dominant, (b) influential, (c) steady-relationship, and (d) compliant personality patterns. The DISC assessment measured the inherent behavioral propensities of individuals, D stood for

dominant; I meant influential and persuasive, S suggested stable and relationship oriented, C stood for compliant and detailed. The results suggested that dominant and steady-relationship individuals have a greater tendency to start their own businesses. Further work by Krueger (2000) examined female entrepreneurs and suggested that dominant DISC personality types were more likely to start a business because they were assertive, creative, restless, and risk takers. This raises the question as to whether or not entrepreneurs who score highly on the dominant and steady relationship constructs may have personality characters in common with teachers who score highly on the proactive elements of the EO construct.

Stewart and Roth (2007) found value in examining achievement motivation and including personality dispositions into models of entrepreneurial behavior. This is not to say that personality dispositions are the only factors in success, but that it is important to link personality traits to important venture outcomes. Therefore, studies that find significant achievement motivation effects should not cause researchers to overlook the important work measuring the influence of entrepreneurial dispositions. It stands to reason that if entrepreneurial dispositions, or characteristics predict success in the corporate sector, they must also have relevance in the public sector, particularly in education where employees may not be used to competition.

Big Five/Five Factor Model

The five-factor model of personality, often called the Big Five, provides a meaningful classification of individual differences. It defines five independent dimensions: (a) Neuroticism, the tendency to exhibit poor emotional adjustment and experience negative effects such as anxiety, insecurity, and hostility; (b) Extraversion, the

tendency to be sociable, assertive, talkative, active, and to experience positive effects such as energy and zeal; (c) Openness to Experience, the disposition to be imaginative, unconventional, and autonomous; (d) Agreeableness, the tendency to be trusting, compliant, caring, and gentle; and (e) Conscientiousness, which comprises two related facets of achievement and dependability (Tziner, Waismal-Manor, Vardi, & Brodman, 2008).

Carsrud and Brannback (2011) maintained that research on personality traits can be a way to understand entrepreneurial behavior. Judge, Heller, and Mount (2002) indicated that Big Five personality traits, including neuroticism, extraversion and conscientiousness allow the Five-Factor model to be used to examine job satisfaction. Tziner et al. (2008) found three of the Big Five factors were significantly related to the measures of job satisfaction and organizational commitment: Agreeableness; Openness to Experience; and Conscientiousness. These factors accounted for 58% of the explained variance in job satisfaction and 44% of the explained variance in organizational commitment.

Zhao and Seibert (2006) revealed a correlation between Entrepreneurial Status and the five-factor personality dimensions and concluded “personality variables appear to have a role in future theories of entrepreneurship” (p. 265). Zhao, Seibert, and Lumpkin (2010) provided evidence that four of the Big Five personality dimensions were related to both entrepreneurial intentions and performance. Koe Hwee Nga and Shamuganathan (2010) suggested Big Five personality traits such as “agreeableness, openness and conscientiousness exert an influence on social entrepreneurship dimensions” (pp. 274-275).

Bateman and Crant (1993) found that the proactive scale was positively correlated with Big Five Factor personality constructs of conscientiousness and extraversion. It was not significantly correlated with openness, agreeableness, or neuroticism. This research implies that high proactives may exhibit “higher levels of problem finding, idea championing, innovation and intrapreneurship” (p. 116). These researchers demonstrated substantial links between entrepreneurial personality characteristics and achievement, suggesting that lessons from the business sector could transfer additional understanding on the appropriateness of the market model in education.

Meyers & Briggs Type Inventory

Krueger (2000) reported that the Meyers Briggs Type Inventory identified four managerial types: the traditionalist, the catalyst, the visionary, and the troubleshooter. This work described the traditionalist as realistic and not focused on relationships; the catalyst as an enthusiastic people person; the visionary as one who solves problems creatively; while the troubleshooter as a less creative counterpart who uses the system. Furham and Springfield (1993) clarified the Meyers-Briggs behavioral assessment branded four behavior temperaments: sensation thinkers, sensation feelers, interactive feelers, and intuitive thinkers.

Carland and Carland (1992) discovered that entrepreneurs were more likely to display a propensity for intuitive thinking. Bergstrom, Sonstelie, and Parendo (2011) found that people who measured closer to the intuiting end of the sense-intuit scale and those who measured closer to the thinking end of the think-feel scale displayed an entrepreneurial personality type. More specifically, two of the four Meyers-Briggs personality measures had statistically significant effects on the likelihood that an

individual would enter the restaurant business. Surprisingly, none of the Big Five factors were “significant.” Again, this work should cause researchers to consider using established and tested market method measurement tools to guide inquiry into the work of education entrepreneurs.

Personality Characteristics of Teachers

Big Five/Five Factor Model

Decker and Rimm-Kaufman (2008) examined how personality traits predict beliefs about teaching in pre-service teachers. They found that pre-service teachers scored high in extraversion, openness, and agreeableness. These characteristics are likely to be beneficial for people entering a job requiring “flexibility, ability to get along with others, and high levels of social interaction” (p. 58). Henson and Chambers (2003) found a limited relationship between personality type as a predictor of teaching efficacy and classroom control in teachers with emergency certification.

Swanson (2011) used a Self Directed Search instrument developed by Holland (1996) to help individuals with career selection. Data from this study suggested that teachers identified with the Holland codes of social, enterprising, and artistic. These vocational codes were linked to the occupational framework of the U.S. Employment Service’s extensive Guide for Occupational Exploration, a reference guide that coded and organized most vocations. Subsequent research indicated that the social, enterprising, and artistic Holland codes were consistent for secondary school teachers regardless of subject matter (Gottfredson & Holland, 1996). While some might find the evidence using the Big Five factor method mixed, there are numerous other researchers that point to success when using personality traits as an indicator of achievement (Rushton, Morgan,

&Richard, 2007; Sears, Kennedy, & Kaye, 1997).

Meyers & Briggs Type Inventory

Wadlington and Wadlington (2011) stated the significance of teacher dispositions cannot be denied, however; the discussion of how these findings can and should be used is in its infancy. Sears et al. (1997) found the most common Meyers-Briggs personality preference type for elementary school teachers to be the sensing, feeling, judging teacher. These personalities are not likely to lead reform movements, or become tomorrow's educational leaders. Rushton, Morgan, and Richard (2007) found extraverted, intuitive, feeling, and perceiving (ENFP) types more likely to be selected "to participate in highly effective leadership groups" (p. 440).

Clark and Guest (1995) suggested that more risk taking catalysts, visionaries, and trouble-shooters will be needed, as teachers expand their roles to become motivators, mentors, counselors, and guides. This research indicates that if entrepreneurial characteristics that contribute to success in other professions may be predictors of success for entrepreneurs in education, then it is important to note that the personality profiles of most teachers show that they do not share the entrepreneurs' high need for achievement and risk taking propensity.

Entrepreneurial Attitudes in Education

Hargadon and Sutton (2000) identified a four-step knowledge-brokering cycle used by innovative organizations: (a) capturing good ideas, (b) keeping ideas alive, (c) imagining new uses for old ideas, and (d) testing promising concepts. Hess (2006) suggested choice-based reforms alone are not sufficient to sustain educational entrepreneurship. Entrepreneurship requires that choice is matched with opportunities for

new entry. It relies on removing barriers for producers of products and services. Hess (2008) further argued that school reform takes place in an ecosystem and that “helping new generations of educational entrepreneurs survive in a hostile environment will require a supply-side strategy” (p. 225). Improving supply would include increasing and distributing financial capital, reducing barriers to entry, and implementing mechanisms for quality control and a more efficient use of human capital. Finally, Hess (2010) concluded that education entrepreneurs succeed by displacing educational leaders, policies, and practices in a vigorous circle of creative destruction.

Childress (2010) presented 19 case studies in education entrepreneurship that demonstrated efforts centered on creating and preparing new pools of talent, developing and managing effective performance tools, and launching and growing new schools. Teske and Williamson (2006) claimed successful educational entrepreneurs change larger systems in ways that outlast the individuals involved. Smith and Petersen (2008) listed three barriers to innovation in public education: (a) traditional political and structural arrangements restrict innovation, (b) market dynamics and incentives do not promote innovation, and (c) a broken research and development cycle, that inhibits the ability to create and scale innovation.

Borsari and Finnigan (2010) investigated how educators used entrepreneurial attitudes and behaviors to be more effective change-agents. In six in-depth case studies, they found: (a) being attentive to one's clients, (b) identifying critical needs and innovative ways to address them, (c) being able to seize opportunities for improvement, (d) having the ability to secure resources outside of one's budget, and (e) that "missing the boat" or "sinking the boat" as risk management strategies are rarely considered in

educational contexts. They concluded that employing entrepreneurial attitudes and behaviors could indeed empower educators.

Possible Negative Impacts of Entrepreneurial Characteristics in Education

Many educational stakeholders contend that competition does not create collaborative environments. Ravitch (2010) argued that charter schools compete for the most successful students in the poorest communities. This competition further disables traditional public schools by leaving the lowest-performing and least-motivated students in the traditional public school system. Smith and Meier (1995) stated there is no evidence that massive institutional decentralization and reliance on the marketplace will improve education. School choice theorists have misidentified problems in the education system and their proposed cures [competition] are likely to reduce equity without improving performance (Ravitch, 2010).

Consoletti(2011) reported that of the 1,100 charters approved in California, 17% have closed. Nationwide, 15% of approximately 6,700 charter schools have closed. These closure rates are lower than small business failure rates and dramatically higher than the percentage of conventional or traditional public schools ever closed or reconstituted. The National Association of Charter School Authorizers (NACSA) specified that charter school closures have declined over the past three years. In 2010-2011, only 6.2% of charter schools reviewed for renewal were closed. This was down from 8.8% in 2009-2010 and 12.6% in 2008-2009 (Medler, Conlan, & Smith, 2012). These declines suggest stronger performance-based accountability measures may be keeping charter schools open.

Knaup (2005) found failure rates of startups to be about 20% per year in each of

the first four years of life for firms in several U.S. industries. Bergstrom et al. (2011) estimated that 27.5% of newly opened, independently-operated restaurants either disappeared or changed ownership in the first year of operation and that 61% were gone within three years of opening. Dunne, Roberts, and Samuelson (1988) studied manufacturing plants and estimated that 61.5% of new entrants exited within five years. Hulsing (2008) found that only 50% of new entrepreneurial organizations survive longer than four years.

These low success rates are attributed to value and attitudinal differences between entrepreneurs and non-entrepreneurs. (Lumpkin& Dess, 1996) High failure rates in start-up ventures may indicate the widespread difficulty in implementing new programs, regardless of whether they occur in the business or education contexts. More importantly, if a preponderance of entrepreneurial efforts fail, then educational programs relying on the entrepreneurial aptitudes of teachers should anticipate increased school failure and school closure rates. To mitigate these consequences, educational leaders should examine the entrepreneurial orientations of the workers most likely to implement new and innovative educational programs, specifically the teachers.

The Entrepreneurial Orientation Construct

A recent meta-analysis suggested that entrepreneurial orientation is a significant predictor of firm performance (Rauch, Wiklund, Lumpkin, & Frese, 2009). Covin and Lumpkin (2011) found that “entrepreneurial orientation” had been referenced in 256 scholarly journal articles by the end of 2010 and that 109 of these articles were published between January 2008 and December 2010. Research on the entrepreneurial orientation construct has garnered more attention than the larger domain of corporate

entrepreneurship. More importantly, research on entrepreneurial orientation is growing at an increasing rate.

The study of entrepreneurial orientation as a construct has evolved and expanded over the last four decades (Chadwick, Barnett, & Dwyer, 2008). Mintzberg (1973) considered an entrepreneurial strategy-making mode as one characterized by the active search for new opportunities and growth. Khandwalla (1977) described an entrepreneurial management style as a bold, risky, and aggressive approach to decision-making. Miller and Friesen (1982) suggested that entrepreneurial firms “innovate boldly and regularly while taking considerable risks” (p. 5).

Lumpkin and Dess (1996) affirmed that entrepreneurial orientation refers to the “processes, practices, and decision-making activities that lead to new entry” (p. 136). They further reasoned that autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness may be present when a firm engages in new entry. The dimensions characterizing entrepreneurial orientation need not strongly or positively covary for the existence of a construct to be claimed. To date, there have been no significant adaptations of the entrepreneurial orientation construct since the publication of Lumpkin and Dess’s (1996) work.

Covin and Wales (2011) made recommendations regarding the use and efficacy of four distinct entrepreneurial orientation measurement models: (a) the Miller/Covin and Slevin (1989) scale, (b) an alternative first-order reflective scale corresponding to Miller’s (1983) composite view, (c) the Hughes and Morgan (2007) scale, and (d) a “Type II” second-order formative scale. Measures that assess the individual dimensions of entrepreneurial orientation and measures that assess combinations of EO’s elements

via a composite dimension are measures of different phenomena.

The study of entrepreneurship has recognized the significance of individuals within the process. Individuals act within an organizational framework. However, the majority of the work that has been done with the EO construct has been on evaluating the behavior of firms. There are very few instruments measuring aspects of entrepreneurship in education. Eyal and Inbar (2003) found instruments that originated from the corporate world measured (a) risk taking, (b) competition, and (c) financial performance. These factors are often less relevant to organizations operating in the public sector. However, there is an opportunity to leverage lessons learned from decades of research on the entrepreneurial orientation construct to create an instrument that will measure the entrepreneurial orientations of teachers.

Components of the Entrepreneurial Orientation Construct

There is a growing body of literature that claims the Entrepreneurial Orientation construct exists as a larger set of five dimensions: autonomy, innovativeness, proactiveness, risk taking and competitive aggressiveness. (Basso, Fayolle, & Bouchard, 2009; Chadwick, Barnett, & Dwyer, 2008; Covin & Lumpkin, 2011; Dess, Pinkham, & Yang, 2011; and Lumpkin & Dess, 1996). All five EO dimensions are briefly described below.

Autonomy. Autonomy refers to the ability to work independently, make decisions and take actions aimed at bringing forth a business concept or vision, and carrying it through to completion (Kanter, 1983). Many scholars have argued that autonomy is necessary for entrepreneurial initiatives to flourish. Antoncic and Hisrich (2003) maintained that autonomy is a basic feature of entrepreneurially oriented organizations.

Autonomy encourages innovation, promotes the launching of new entrepreneurial ventures, and increases the competitiveness of firms (Brock, 2003). Firms dependent on consensus being reached before launching new initiatives may suffer financially (Covin, Green & Slevin, 2006).

Dimensions of autonomy enable a team, or individual, to define the problem and set the goals that will be met to solve the problem (Lumpkin et al., 2009).

Entrepreneurship requires “the exercise of autonomy by strong leaders, unfettered teams, or creative individuals who are disengaged from organizational constraints” (Lumpkin & Dess, 1996, p. 140). Autonomy is crucial in providing the freedom and flexibility to develop and implement entrepreneurial initiatives (Lumpkin et al., 2009). Research by Schjoedt (2009) showed that “autonomy, variety, and feedback are significant predictors of entrepreneurs’ job satisfaction” (p. 639). These findings point to autonomous decision-making and action providing a path for achieving strategic advantages and improved entrepreneurial outcomes.

Farris-Berg et al. (2013) claimed teachers have autonomy when they are granted decision-making authority in 10 areas influencing whole school success: (a) selecting colleagues, (b) transferring or terminating colleagues, (c) evaluating colleagues, (d) setting staff patterns, (e) selecting and deselecting leaders, (f) determining budget, (g) determining salaries and benefits, (h) determining learn program and materials, (i) setting the schedule, and (j) setting school-level policies.

Innovativeness. Schumpeter (1942) defined the process of “creative destruction” where wealth is created and existing market structures are disrupted by the introduction of new goods or services. This causes resources to shift away from existing firms and

cause new firms to grow. Kimberly (1981) found innovativeness represents a willingness to depart from existing technologies or practices and venture beyond the current state of the art. A modern example is how the Netflix DVD service developed a subscription model to mail DVDs directly to consumer's residences, thus changing the video rental business to the considerable detriment of Blockbuster, Hollywood Video and a host of small "mom and pop" family businesses (Kaplan, 2012).

Proactiveness. Crant and Bateman (2000) defined proactive employees as "those who identify opportunities and act on them, show initiative and persevere until they bring about meaningful change" (p. 65). They reported that managers who scored themselves higher on proactive personality were also rated as charismatic leaders by their bosses. This study of 156 managers suggested that charismatic leadership was positively associated with proactive personality.

Proactive behavior can be described as behavior that "directly alters environments" (Bateman & Crant, 1993, p. 104). The prototypic proactive personality is unconstrained by situational forces. Proactive people scan for opportunities, show initiative, take action, and persevere until they bring about change. Leavitt (1988) called them "pathfinders." Pathfinders change their organization's mission, find and solve problems, and take it upon themselves to have an impact on the world. Lumpkin and Dess (1996) concluded that a "proactive firm is a leader rather than a follower, because it has the foresight to seize new opportunities" (p. 147).

Risk taking. Miller and Friesen (1978) defined risk taking as "the degree to which managers are willing to make large and risky resource commitments" (p. 923). Brockhaus (1980) identified "risk propensity" which was understood to be "perceived probability of

receiving the rewards” from a successful entrepreneurial outcome (p. 513). Viewing risk taking through the prism of school accountability, Ylimaki (2005) defined the term “as taking a chance on the best research evidence available when the outcome is not certain, but the political consequences for failure are high” (p. 4). Researchers (Fullan, 1999; Leithwood & Montgomery, 1982; Neihart, 1999) have advised educational leaders to support risk taking for innovation and change to occur in classrooms. This work indicates that evaluating urban teachers along a continuum for risk taking aptitudes would have validity when identifying educators to lead work in innovative programs.

Competitive aggressiveness. Miller (1983) characterized firms with competitive aggressiveness as those who beat competitors to the punch. Covin and Slevin (1989) defined an aggressive competitive orientation as a strong risk taking propensity by top management (p. 79). Lumpkin and Dess (1996) clarified that competitive aggressiveness was about “competing for demand” (p. 147). In the education sector, competing for students is only prevalent in the pursuit of the 2% of American students that were enrolled in charter schools in 2007 (Grady & Bielick, 2010). Benveniste, Carnoy, and Rothstein (2003) reported many policymakers believe private education is better and cheaper than public education. The drive to finance private educations with public funds is grounded in the belief that competition will make major improvements in the American public education system.

The five components of autonomy, innovativeness, proactiveness, risk taking, and competitive aggressiveness make up the entrepreneurial orientation construct. Some researchers make an argument for conducting inquiry with the original three dimensions of innovativeness, proactiveness, and risk taking (Bolton & Lane, 2012; Covin & Slevin,

1991; Miller, 1983; Rauch, Frese, Koenig, & Wang, 2009). Many parallels can be made between the business environment and the education environment. Certainly, a case can be made for attempting to measure these characteristics among teachers to inquire whether a school system has the internal capacity for change. The present study only utilized three dimensions of innovativeness, proactiveness, and risk taking in its Teacher Entrepreneurial Orientation (TEO) construct. The researcher tried to validate a five dimensional model, but discarded the dimensions of autonomy and competitive aggressiveness when multiple pilot tests indicated they could not be consistently measured. Other researchers have reported the same difficulty in validating measures for autonomy and competitive aggressiveness (Bolton & Lane, 2012; Phalen, Johnson, & Semrau, 2013).

EO as a Dispositional or Behavioral Phenomenon

Entrepreneurial Orientation (EO) has been conceptualized in two principal ways: (a) the composite dimension approach associated with Miller's (1983) and Covin & Slevin's (1989) work and (b) the multi-dimensional approach associated with Lumpkin & Dess's (1996) work. In the multidimensional view of Entrepreneurial Orientation, the construct exists as a set of independent dimensions: namely, autonomy, innovativeness, proactiveness, risk taking, and competitive aggressiveness. These five dimensions constitute the EO construct. Basso, Fayolle, and Bouchard (2009) reported the scholarly community has yet to settle on a conceptualization of EO that is widely agreed upon.

There are questions as to whether EO exists as a dispositional or behavioral phenomenon, yet Covin and Lumpkin (2011) reported researchers have united around the understanding that EO is an organization-level phenomenon. It is important to note that

this does not mean that individuals cannot exhibit tendencies that indicate entrepreneurial thought and action. While some researchers caution that expanding the EO concept to other units of analysis may dilute the construct's value, Dess, Pinkham, and Yang (2011) suggest that future research in EO explicitly consider theoretical and descriptive generalizability and propose that "context" play a more significant role in theoretical development and research design.

Covin and Slevin (1991) argued the occasional exhibition of organization-level entrepreneurial behavior is insufficient to infer the existence of an EO. A firm must exhibit entrepreneurial behaviors over time to recognize that pattern of behavior as a defining attribute of the firm. The Miller/Covin and Slevin scale is perhaps the most frequently used EO measure and it incorporates items that reflect both dispositions and behaviors. Researchers are often challenged with identifying meaningful secondary data that corroborate EO measures based on primary data (Lyon, Lumpkin, & Dess, 2000).

Two recently employed approaches to EO measurement using secondary data sources may lessen these concerns. The computer-aided text analysis (CATA) approach used by Short, Broberg, Cogliser, and Brigham (2009) scans published documents for language indicative of an organization's EO level. Another approach to measuring EO with secondary data by Miller and LeBreton-Miller (2011) created a composite index using a firm's R&D-to-Sales ratio (innovativeness), the percentage of profits re-invested in the company each year compared to that of rivals in the same industry (proactiveness), and volatility in the firm's share price not associated with industry or economic fluctuations (risk taking).

It is doubtful that this index could be recreated with educational institutions, as they do not operate on a for-profit basis and funding streams are often not based on performance. However, quantitative theorists might be willing to build logic models showing a school's expenses on new curriculum and/or professional development correlated with increases or decreases in the student achievement as reflected by API scores. Subsequent experimentation with statistical analysis and or modeling of secondary educational data may produce an equivalent to the Miller and LeBreton-Miller (2011) composite index.

Subsequent EO inquiry could involve computer-aided text analysis of school instructional plans and related documents for deeper scrutiny of entrepreneurial orientations or levels of innovation within organizations. Hambrick (2007) noted the entrepreneurship research community generally eschews research foci not accurately explained with a recognized theory. Thus, researchers should pair efforts to use secondary EO data analysis with a sound theoretical lens that would allow for robust research designs and numerous triangulation opportunities.

Theoretical Lenses in EO Research

Many researchers (Anderson, Covin, & Slevin, 2009; Bierly, Damanpour, & Santoro, 2009; Hughes & Morgan, 2007; Kor, Mahoney, & Michael, 2007; Kreiser, 2011; Prahalad & Bettis, 1986; Teece, Pisano, & Shuen, 1997; Zahra, Sapienza, & Davidson, 2006) have developed theoretical lenses for working with EO. A short review follows.

Kor et al.'s (2007) subjectivist theory of entrepreneurship emphasizes the nature of discovery and how the entrepreneur's experience and prior knowledge affects

perceptions of opportunity. Teece et al. (1997) offer the theory of dynamic capabilities, which postulates that core competencies create competitive advantages. Dynamic capabilities may be another theoretical lens germane to EO research. Zahra et al. (2006) define dynamic capabilities as “the abilities to reconfigure resources and routines in the manner envisioned and deemed appropriate by its principal decision-maker(s)” (p. 918). This lens can be utilized as means for linking EO to opportunity exploitation and subsequent performance.

Prahalad and Bettis (1986) use the phrase “dominant logic” to refer to how firms conceptualize and make critical resource allocation decisions. The theory of dominant logic captures the mindset exhibited by entrepreneurial organizations and is consistent with the notion that sustained patterns of behavior are needed to infer the existence of an EO. A final theoretical lens through which EO can be better understood is that of learning theory. Anderson et al. (2009); Bierly et al. (2009); Hughes and Morgan, (2007); and Kreiser, (2011) linked EO to causally adjacent phenomena via learning-related processes, various endogenous processes and contextual attributes. While EO learning theory seems particularly well-suited to providing insight regarding organizational change, all of this work is also relevant to districts using portfolio management models that capitalize on market principles, expanded choice, autonomous schools, and central offices redesigned to support new start up schools. These theorists offer valuable insight for policy makers and educational leaders to consider when implementing entrepreneurial programs in the education context.

Trends in EO Research

Recent researchers have made advances in using the EO construct on individuals

instead of firms. Bolton and Lane (2012) developed an instrument to measure an individual Entrepreneurial Orientation. The instrument was validated and then tested on 1,100 university students. Also individual dissertation efforts (Byrne, 2008; Josien, 2008; Otote, 2008; Schiefen, 2010; Smith, 2011; Stewart, 2009; Stoudt, 2012) have applied the EO construct into a variety of new settings. Byrne (2008) surveyed 3,816 teachers using Eyal and Inbar's (2003) public school entrepreneurial inventory (PSEI) to determine the level of entrepreneurial organizational characteristics in Hawaiian public elementary schools. Josien (2008) looked at the antecedents of the EO construct. Stewart (2009) used EO to understand the effects of an intrapreneurial orientation at lower levels in an organization, examining the impacts that proactive, innovative, and/or risk taking natures may have on frontline employee performance. Otote (2008) investigated entrepreneurial orientation and productivity in nurses in a nonprofit health-care organization. Schiefen (2010) explored the entrepreneurial orientation of the community college workforce. Smith (2011) developed an Entrepreneurial Orientation Profile Inventory (EOPI) to evaluate the proactiveness, innovativeness, and risk taking dimensions of EO. Stoudt (2012) looked at EO in non-profit organizations to determine its effect on social entrepreneurs.

This scholarly work is consistent with George and Marino (2011) who advised researchers to apply the EO concept to a new setting either through *concept travelling*, which “entails increasing the extension of a concept while decreasing its intension, or through *concept stretching*, increasing the concept's extension while either maintaining or increasing the intension” (p. 994) These authors argue that stretching implies additional attributes may be added to the concept while increasing the number of cases to

which it is applied. This may result in an extremely broad concept that could be difficult to separate from other theoretical concepts. Concept travelling should be preferred over concept stretching as stretching may create a reduction in the precision of a concept. George and Marino (2011) recommend researchers “continue to build on the original three-dimension definition, which has been used by the majority of researchers through effective concept travelling” (p. 995).

Hundreds of researchers have devoted years to applying EO theory in a variety of contexts. They have encouraged others to use their theories in other environments. The education literature appears suitable for additional analysis using EO theories, techniques, and instruments. There is further justification for considering secondary data sources and employing established theoretical lenses when exploring the education context with an EO instrument. Further, there is no evidence to suggest that entrepreneurial orientation constructs do not exist within teachers. By cross applying lessons learned from EO research to market model approaches within education, researchers may unearth new insight on the effects of competition with educational entrepreneurship, school choice, and other innovative programs.

Conducting Survey Research Online

Many studies have been conducted on the reliability and appropriateness of electronic survey research (Barrios, Villarroya, Borrego, & Ollé, 2011; Birnbaum, 2004; Bonometti & Tang, 2006; Johnson, Shin, & Rao, 2012; Lin & Van Ryzin, 2011; Nonnecke, & Preece, 2003; and Vicente & Reis, 2010). These studies generally draw three conventional conclusions: (a) researchers find online surveying quick, efficient, and cost-effective; (b) researchers find the data quality from conventional paper, pencil, and

U.S. Postal Service superior; and (c) researchers advocate using multiple methods to maximize the advantages of each technique.

Birnbaum (2004); Johnson, Shin, and Rao (2012); Phelps, Lewis, Mobilio, Perry, and Raman (2004); Thorp, Lupi, Couper, and Kaplowitz (2012); and Williams (2012) generally found electronic survey collection methods to be effective. Andrews, Nonnecke, and Preece (2003); Bonometti and Tang (2006); Lin and Van Ryzin (2011) discovered issues in electronic survey research and favored traditional approaches. While Barrios, Villarroya, Borrego, and Ollé (2011), and Vicente and Reis (2010) argued for researchers to incorporate a method that blended both approaches. A brief selection of their evidence follows:

Web surveys are increasingly being incorporated into national survey data collection programs in the United States because of their cost and time-efficiencies (Johnson et al., 2012). Web surveys are increasingly popular as research tools, as Birnbaum (2004) discovered, they allow one to efficiently recruit large, heterogeneous samples quickly, recruit specialized samples of people with rare characteristics, and to standardize procedures, making studies easy to replicate.

Williams (2012) found little evidence that a questionnaire form displayed on a computer that requires a subject to use a keyboard and/or mouse to respond would systematically bias responses. This research noted “most modern texts recommend using both mail and web survey modes as a way to get the advantages of both and ameliorate the defects of each” (Williams, 2012, p. 12). One potential downside to soliciting respondents via email is that Witmer, Colman, and Katzman (1999) found email response rates of 20% or lower are not uncommon. Thorp et al. (2012) advised that advance letters

are cost-effective means for increasing response rates in mail surveys and interviewer-administered surveys.

Lin and Van Ryzin (2011) used an experimental design to administer a web-based survey and a mail survey to nonprofit professionals working in human services organizations. The mail survey achieved a higher response rate than the web survey, and data obtained from the mail survey produced higher internal consistency than that obtained from the web survey. There was no difference in respondent characteristics, the completeness of the survey, and the percentage of missing items. These findings suggest that a mail survey may have response-rate and data-quality advantages over a web survey despite being more costly than a web-based survey.

Johnson et al. (2012) conducted a comparison study of web and mail in a U.S. National Panel Survey and found that web-based surveys elicited higher data quality in terms of item responses to both closed- and open-ended questions. Phelps et al. (2004) conducted three studies on examining consumer responses and motivations to pass along email. They found that targeting the right people is essential and found electronic survey research productive when targeting an affinity group where one is reaching people who are ready for the message. This suggests that using school principals as a mechanism to solicit teachers may be appropriate, because by forwarding the email solicitation, the principal is acting within the scope of an instructional leader's duties if they choose to forward information about participating in educational research on to their teachers.

Birnbaum (2004) concluded many investigators consider the advantages in experimental power, low cost, and convenience of testing via the Web to outweigh its disadvantages. Experience with studies done via the Web and in the lab indicates that if

Web studies are properly designed, one can replicate lab results in many fields of psychology.

For the purposes of this study, email solicitations were chosen as the primary recruitment method. Due to the principal researcher's difficulty with scale validation and pilot testing, time did not permit use of a multi-pronged approach with telephone contact, email surveys, and post office distributed paper surveys. Email solicitations were sent to principals at California charter, private, and traditional public schools. It was up to the school principal to decide whether or not they wanted to encourage their teachers to participate in this research project.

Conclusion

Many personality profiles administered to teachers reveal that they do not share the entrepreneurs' high need for achievement and risk taking propensity. Decades of EO research in the corporate sector indicate that the factors that give the entrepreneur the tenacity to persist through failure may be reliably measured by the EO construct. This literature review suggests that developing an entrepreneurial orientation construct to measure the degrees of difference in teachers is novel, yet appropriate.

A primary goal of this study was to develop an entrepreneurial orientation instrument that could consistently and reliably measure EO in teachers. The study also asked the following questions: (a) What is the distribution of entrepreneurial characteristics among teachers at different school types (elementary, middle, and high school)? (b) Which entrepreneurial characteristics are most frequently self-reported by teachers? (c) Is one sample of teachers more disposed to innovation or risk taking than others?

The literature on entrepreneurs indicated that studying new venture formation is difficult. The reasons for new venture failure are complex and varied, however, just as some education literature (Darling-Hammond, 2000; Marzano, 2003) indicates that the strongest predictor of student achievement is an effective teacher. The EO literature suggests that the strongest predictors of innovation may be measured by the dimensions of the entrepreneurial orientation construct. Measuring teachers along innovativeness, proactiveness, and risk taking is uncharted territory in the field of education. However, in the corporate sector, this work is not novel and there are many flourishing businesses that provide such services.

The next chapter discusses the methods used to answer these research questions.

Chapter III: Methodology

This chapter elaborates on the major research question being examined by this study: Do the entrepreneurial orientations of teachers in charter, private, and traditional public schools differ along constructs of innovativeness, proactiveness, and risk taking? Subquestions investigated: (a) What is the distribution of entrepreneurial characteristics among teachers at different school levels (elementary, middle, and high school)? (b) Which entrepreneurial characteristics are most frequently self-reported by teachers? (c) Is one subgroup of teachers more disposed to innovativeness, proactiveness, or risk taking than others? The rationale for using EO as a lens to examine entrepreneurs in education has been affirmed. Further discussion will situate the case in the tradition of grounded theory development. Then, the reasoning behind the sample selection, data collection, analysis techniques, and instrument pilot tests will be described in detail.

Hypotheses

This study developed an instrument to measure the entrepreneurial orientation of teachers. This instrument was validated by multiple pilot tests and exploratory factor analysis on a sample of 729 California teachers. The study's research questions have been transformed into hypotheses for empirical testing.

(H₁) The entrepreneurial orientations of teachers in charter, private, and traditional public schools will differ along constructs of innovativeness, proactiveness, and risk taking.

(H₂) The distribution of entrepreneurial characteristics among teachers will vary at different types of schools (elementary, middle, and high school).

(H₃) Certain entrepreneurial characteristics will be more frequently self-reported

by teachers.

(H₄) One sample of teachers is more disposed to innovativeness, proactiveness, or risk taking than others.

Research Design/Tradition

This quantitative study employed a Teacher Entrepreneurial Orientation (TEO) instrument (see Appendix C). This 18-item Likert-type scaled survey measured teachers' individual values along three constructs: (a) innovativeness, (b) proactiveness, and (c) risk taking. The five point Likert scale ranged from 1 = very untrue of me to 5 = very true of me. Each subscale used six items to measure differences between teachers. This research drew on Glaser and Strauss' (1967) work in grounded theory development. Ary, Jacobs, and Razavieh (2002) state grounded theory was "designed to develop a theory of social phenomena based on the field data collected in a study" (p. 28). Creswell (2008) explains this "generates a theory when existing theories do not address your problem... Because a theory is grounded in the data, it provides a better explanation than a theory borrowed off the shelf." (p. 432).

This study created a body of knowledge for the education research community on the three factors that comprise an entrepreneurial orientation construct. Theories as to the distribution and pervasiveness of these factors among charter, private, and traditional public school teachers are discussed in Chapter V. A sample of 729 California teachers completed the TEO instrument. This sample was subdivided into three groups: charter school teachers, private school teachers, and traditional public school teachers. Exploratory factor analysis was conducted to confirm the validity of the instrument. ANOVA and multiple regression tests were conducted to answer the research questions.

Research Setting

To specify context, the investigator has provided employment statistics for educators in the state of California. This is to help readers understand the complexities in recruiting and retaining teachers on the scale required to maintain an education system that is competitive nationally. These statistics were disaggregated for the three populations of teachers examined in this research: (a) charter schools; (b) private schools; and (c) traditional public schools. A profile of typical internet users is provided from a November 2012 Pew Research study (Zickuhr & Smith, 2012). Then the demographics of the national population of teachers were supplied to give additional context for the sample that participated in this study by completing the Teacher Entrepreneurial Orientation (TEO) questionnaire.

Charter Schools

Over a 19 year span, California Charter Schools increased in number from 31 in 1993 to 912 in 2011 (California Charter Schools Association [CCSA], 2011). According to the National Alliance for Public Charter Schools (2011), California had 983 charter schools operating in 2010-11, that served 9.2% of California students. The California Charter Schools Association reported that in 2010-11, charter schools served a population of 357,610 students and represented the largest concentration of charter schools in the United States. During the 2010-2011 school year, the number of charter schools grew by 115 statewide, which was the largest one-year growth in the history of the charter school movement (www.calcharters.org/CCSA_Fact_Sheet.pdf).

Private Schools

State-wide “3,644 California private schools served 539,726 students and employed 45,741 teachers” (Broughman, Swaim, & Hryczaniuk, 2011, p. 20). California’s private schools enrolled approximately 600,000 students representing nearly 10% of the state’s total K-12 enrollment. California Education Code (EC) Section 33190 states that “persons, firms, associations, partnerships, or corporations offering or conducting private school instruction at the elementary or high school level for students between the ages of six and eighteen years shall file the Private School Affidavit (PSA)”. For the purposes of this study, the California Department of Education (CDE) database was selected as the most reliable and current source of information about private schools in California. For the 2012 school year, 3,155 private schools filed an affidavit with the state and these schools employed a total of 39,841 full time teachers (CDE, 2012).

Traditional Public Schools

The California Commission on Teacher Credentialing (CCTC) reported that there were 347,046 educators in California public schools during the year of 2009-2010 (CCTC Quickfacts, 2010). Bland et al. (2011) reported that in 2007–08, the number of K–12 teachers employed in California was over 310,000, but due to cuts in education, by 2010–11, that number had shrunk to less than 287,000. This changed the teacher workforce dramatically. California now has fewer new teachers and more than half of the state’s teachers (57%) have “been in the classroom for over 10 years” (Bland et al., 2011, p. x).

Since the instrument used by this study was distributed and completed online, it is important to look at the demographics of internet users to predict whether or not it is feasible to reach teachers via conventional online survey methodology. According to the Pew Internet and American Life Project, a longitudinal study of internet behavior dating from March 2000 until the present, 80% of American men use the internet, while 82% of American women use the internet. Eighty-four percent of Whites, 73% of Blacks, and 74% of Hispanics use the internet. Only 54% of people over the age of 65 report using the internet, however, of those with a college degree, i.e. teachers, 95% are internet users. Internet usage also increases as income increases (Zickuhr & Smith, 2012). This suggests that using the internet to recruit teachers for an online, web-based survey may be an effective means to cost effectively gather a large number of respondents. However, the online teacher population may trend majority female and majority elementary school teachers, which is in line with research from Feistritzer, Griffin, and Linnajarvi (2011) on the teaching force in the United States, which stated, “Eighty-four percent of public

school teachers are female” (p. 12). The proportion of K-12 teachers who are White dropped from 91% in 1986 to 84% in 2011 (Feistritzer et al., 2011). Age demographics show that 22% of teachers were under the age of 30, while the proportion of teachers 50 and older dropped from 42% to 31% in 2011 (Feistritzer et al., 2011). By teaching assignments, 48% of US teachers taught in elementary grades, or PK- 4; 26% taught in the middle grades 5 – 8; and 27% taught high school grades 9 – 12 (Feistritzer et al., 2011). Therefore, the sample in this study was representative of the larger population of teachers in California and the nation.

Research Sample and Data Collection

This survey of 729 California charter, private, and traditional public school teachers was conducted in February of 2013. This study used publically accessible school contact information from the state of California’s Department of Education web page (www.cde.ca.gov/sp/ps/rq). Excel files of more than 20,000 schools were downloaded. They were separated into three databases: charter, private, and traditional public. Principals’ email addresses were collected from the databases, imported into a third party email marketing client, and randomly selected to receive an email solicitation, which they could forward on to their teachers. The mass email platform automatically eliminated duplicate addresses and errors in web syntax, for example, if an address had .co instead of .com, those addresses were eliminated from the system. On February 21, 2013, randomly selected email solicitations were sent out to 681 charter schools principals, 1,388 private school principals, and 7,767 traditional public school principals. To avoid any potential conflict of interest with the principal researcher’s employer, the 900 traditional public

schools making up the Los Angeles Unified School District were not solicited for participation in this study.

Due to the difficulty of garnering advance permission to conduct research from 900 individual school districts and 58 County offices of Education in the state of California, an informed consent message was included in the email solicitation and embedded within the online survey (See Appendix A). All teacher responses were collected anonymously. School district performance levels, or individual school data were not requested for this study. The online survey collector was configured so that only one response could be collected from an Internet Protocol (IP) address to eliminate the possibility of a respondent entering data multiple times from the same computer.

Following recommendations from Andrews et al. (2003), the researcher incorporated many design features used to reduce attrition. The survey introduction made full disclosure of what research was being conducted, offered direct access to the researchers, and noted institutional review board (IRB) approval. Thorp et al. (2011) suggested e-mail invitations using “short” estimates of survey completion time (3–5 min) as opposed to “long” estimates (10–15 min) resulted in higher response rates to web surveys. Thus, a realistic estimate of the time required to complete the teacher EO survey (5 minutes) was provided. Indicators of survey progress were displayed throughout the experience. All demographic data: gender, age, type of school, and years of teaching experience was collected at the beginning of the survey.

Sample one was selected from the California Department of Education’s database of charter schools. This listing of schools can be sorted by charter number, school name, school district name, and county name. Then, using this Excel database, a series of

random numbers was generated using <http://www.randomizer.org/form.htm>. The researcher solicited charter school principals via email on February 21, 2013. A random sample of 681 emails was sent out, 56 (8.2%) of those emails were not delivered, because the address bounced. Twenty percent or 125 charter school principals opened the email. It is not known how many principals forwarded the email onto their teachers.

Sample two was randomly selected from private schools operating within the state of California. These schools were selected from the 2012 Private School Directory compiled by the California Department of Education. An Excel database of all of California's 3,155 private schools was downloaded and sorted by county. Then, schools were selected at random from this database for participation in this study. On February 21, 2013, 1,388 private school principals were sent an email solicitation asking them to encourage their teachers' participation in this study. There was a bounce rate of 9.7%, which meant that 143 of these emails did not get through to their intended recipient. However, 231 of these private school principals opened the email for an open rate of 16.6%.

Sample three was randomly selected from traditional public schools from the California Department of Education's listing of 17,149 public schools at <http://www.cde.ca.gov/ds/si/ds/pubschls.asp>. First, charter schools needed to be separated from this list. Then, LAUSD schools were removed from this database. Schools were selected at random and on February 21, 2013, email solicitations were sent to 7,767 public school principals asking if they would forward the email link onto their teachers. Approximately 16.2% or 1,259 of these emails bounced, while 12.8% of these principals opened the email.

The 729 respondent sample for analysis in this dissertation was downloaded at 1:00 pm on Tuesday, February 26, 2013. This was approximately five days after the first email solicitations were sent out. A total of 708 surveys had been completed correctly for a total finished survey rate of 97.1%. The email solicitation strategy produced an average of 142 responses per day, reaching the minimum sample of 360 teachers required for quantitative statistical analysis within three days. The sample was revised up to 729 respondents using the SPSS statistical technique of statistical averaging. A summary of the sample is included in Table 3.1 below.

After reviewing the demographics, it is reasonable to conclude this sample of 729 California teachers could be generalizable to the teacher workforce within the state of California, but the sample was not quite large enough to be predictive of the national profile of teachers in the United States.

Table 3.1

Demographic Data of Study Participants

	All Teachers (N = 729)	Charter School (N = 228)	Private School (N = 151)	Traditional Public School (N = 350)
Gender				
Male	179 (24.6%)	58 (25.4%)	39 (25.8%)	82 (23.4%)
Female	550 (75.4%)	170 (74.5%)	112 (74.2%)	268 (76.6%)
Ethnicity				
White	539 (73.9%)	156(68.4%)	123 (81.5%)	260 (74.2%)
Hispanic	82 (11.2%)	31 (13.6%)	11 (7.3%)	40 (11.4%)
Asian-Pacific Is.	21 (2.9%)	7 (3.1%)	2 (1.3%)	12 (3.4%)
African-American	13 (1.8%)	7 (3.1%)	3 (2.0%)	3 (0.9%)
Bi/Multi Racial	34 (4.7%)	11 (4.8%)	6 (3.9%)	17 (4.9%)
Decline to State	40 (5.5%)	16 (7.0%)	6 (3.9%)	18 (5.1%)
School Level				
Elementary	352 (48.2%)	74 (32.4%)	75 (49.7%)	203 (58.0%)
Middle	136 (18.7%)	61 (26.8%)	36 (23.8%)	39 (11.1%)
High	241 (33.1%)	93 (40.8%)	40 (26.5%)	108 (30.9%)

A follow up Chi-square analysis found that participants from all three types of schools were similar in gender and ethnic composition (all $ps > .240$, ns). Compared to the overall sample, elementary teachers were over-represented in the traditional public school teacher subgroup and middle school teachers were over-represented in the charter school subgroup ($\chi^2(4, 724) = 46.119, p < .001$). Compared to the overall sample, charter school teachers were over-represented in both 1-5 and 6-10 years of experience and under-represented in the 20+ years of experience. Traditional public school teachers were over-represented in the 16-20 years of experience subgroup and private school teachers were over-represented in the 20+ years of experience subgroup ($\chi^2(8, 720) = 69.943, p < .001$).

Instruments and Procedures

The following instruments were used to develop the author's Teacher Entrepreneurial Orientation (TEO) instrument: the Lumpkin and Dess (1996) scale was used to adapt measures measuring autonomy; items related to the proactive personality construct were tailored from Bateman and Crant (1993); and the Miller/Covin and Slevin scale (1989) was used to adapt items measuring innovativeness, proactiveness and risk taking. Additional innovation items for public schools were developed from Eyal and Inbar (2003). Competitive aggressiveness was measured by incorporating questions from the Hughes and Morgan (2007) instrument. An additional ten items were generated from an individual entrepreneurial orientation scale validated by Bolton and Lane (2011).

Pilot Tests of Teacher Entrepreneurial Orientation Measures

Between October 2012 and February 2013, the principal researcher conducted content adequacy assessment tests on the adapted entrepreneurial orientation instrument.

These pilot tests were designed to validate and reduce the number of items used in the final instrument. The American Psychological Association states that an “appropriate operational definition of the construct a measure purports to represent should include a demonstration of content validity, criterion-related validity and internal consistency” (APA, 1995, as cited by Hinkin, 1998, p. 105). In short, construct validity is the extent to which a psychometric scale measures what it claims to measure.

Using 40 years of Entrepreneurial Orientation research as a well-defined theoretical foundation, this pilot test employed domain sampling theoretical procedures outlined by Ghiselli, Campbell, and Zedeck (1981) to deductively create items that consistently describe an EO behavior or affective response. A precise scale development protocol was followed to assure adequate domain-specific measurement of the entrepreneurial orientation construct with school teachers. The researcher followed a procedure suggested by Hinkin (1998) that used a process of: (a) item generation, (b) questionnaire administration, (c) initial item reduction, (d) factor analysis, and (e) replication.

The principal researcher conducted pilot tests to develop a valid and reliable survey instrument. The first pilot test was conducted in November of 2012. It involved 41 educational leaders. The second pilot test was conducted in December of 2012 and involved 72 randomly sampled teachers. The third pilot test was conducted in January of 2013 and involved 54 randomly sampled teachers. The fourth pilot test was conducted in February of 2013 and also involved 54 randomly sampled teachers. Dr. William J. Wales and Dr. Marshall W. Pattie of James Madison University participated in the February pilot test and used a number of validated items in a separate survey conducting EO

research with a sample of 800 MBA students. The results of pilot testing are displayed in the Appendix B in Tables B.1-B.15.

The final instrument is exhibited in Appendix C. It contained 18 Likert-type-scaled items and each of the entrepreneurial orientation dimensions of innovativeness, proactiveness, and risk taking and used six questions to measure differences reported by teachers. The researcher tried to validate a five dimensional model, but discarded the dimensions of autonomy and competitive aggressiveness when multiple pilot tests indicated they could not be consistently measured. Other researchers reported similar difficulties in validating measures for autonomy and competitive aggressiveness (Bolton & Lane, 2012; Phalenet al., 2013).The instrument was completed online with items presented one at a time. Respondents could not go back and change answers.

Review of domain definitions

After the literature review and consultation with committee members and outside EO experts, the definitions for innovativeness, proactiveness, and risk taking presented in Tables 3.2-3.4 were used in the development of the Teacher Entrepreneurial Orientation items. The principal researcher amended these definitions and developed items with CSUN professor Merle Price, who provided outstanding counsel during this process.

Table 3.2

Innovativeness Definitions

Definition	Author(s)
Process of creative destruction where wealth is created and existing market structures are disrupted by the introduction of new goods or services.	Schumpeter, 1942
A willingness to depart from existing technologies or practices and venture beyond the current state of the art.	Kimberly, 1981
People who can take an idea that's obvious in one context and apply it in not-so-obvious ways to a different context.	Hargadon & Sutton, 2000
A tendency to engage in and support new ideas, novelty, experimentation, and creative processes.	Hage, 1980
The predisposition to engage in creativity and experimentation through the introduction of new products/services as well as technological leadership via R&D in new processes.	Rauch et al., 2009, p. 763
Innovativeness captures a teacher's willingness to depart from traditional methods of teaching and learning by developing novel ideas, experimenting with new approaches, and being creative.	Petri, Wales, & Pattie, 2013 (personal communication, February 11, 2013)

Table 3.3

Proactiveness Definitions

Definition	Author(s)
Employees who identify opportunities and act on them, show initiative and persevere until they bring about meaningful change.	Crant & Bateman, 2000
Proactive people scan for opportunities, show initiative, take action and persevere until they bring about change.	Bateman & Crant, 1993
Pathfinders who change their organizations' missions, find and solve problems and take it upon themselves to have an impact on the world.	Leavitt, 1988
An opportunity-seeking, forward-looking perspective characterized by the introduction of new products and services ahead of the competition and acting in anticipation of future demand.	Rauch et al., 2009, p. 763
Proactiveness captures a teacher's initiative when anticipating problems, identifying opportunities to solve them, taking immediate, often preventative action, and persevering until their planning brings about results.	Petri et al., 2013 (personal communication, February 11, 2013)

Table 3.4

Risk Taking Definitions

Definition	Author(s)
The degree to which managers are willing to make large and risky resource commitments.	Miller & Friesen, 1978
The perceived probability of receiving the rewards from a successful entrepreneurial outcome.	Brockhaus, 1980
Taking a chance and trying new beliefs and practices when the outcome of a change process is not certain.	Neihart, 1999
Taking a chance on the best research evidence available when the outcome is not certain, but the political consequences for failure are high.	Ylimaki, 2005
Taking bold actions by venturing into the unknown, borrowing heavily, and/or committing significant resources to ventures in uncertain environments.	Rauch et al., 2009
Risk taking captures a teacher's willingness to take chances and gamble on unproven approaches, even when the outcome is highly uncertain.	Petri et al., 2013 (personal communication, February 11, 2013)

Results of TEO Instrument Validation

In an initial exploratory factor analysis, four components had eigenvalues that scored above the 1.0 minimum threshold. Risk taking, with an eigenvalue of 5.91, accounted for 22% of the variance in total EO score. Innovativeness, with an eigenvalue of 3.09, accounted for 20% of the variance in total EO score. Proactiveness, with an eigenvalue of 1.39, accounted for 16% of the variance in total EO score. These factors combined accounted for 58% of the total variance in total EO score. The fourth factor did not explain any additional variance and was excluded from the study.

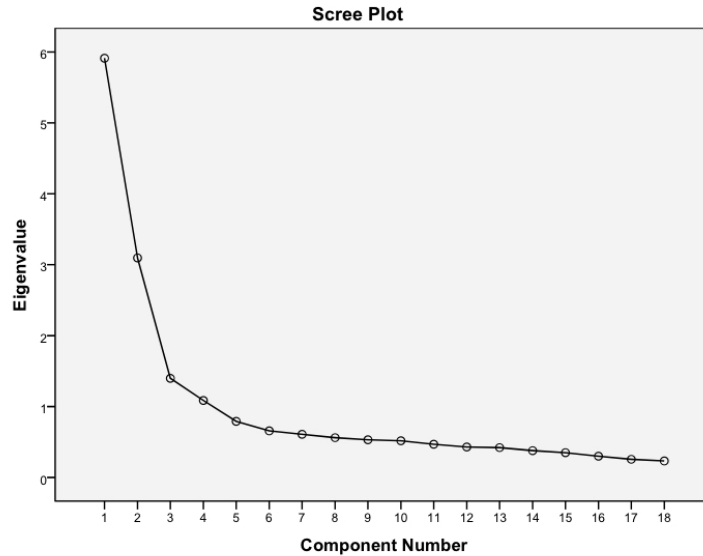


Figure 3.1. Scree Plot of EO Components.

A visual inspection of the scree plot in Figure 3.1 showed that the first three factors had the most dramatic drop off before the curve began to level off. This confirmed that the three factors of risk taking, innovativeness, and proactiveness should be retained, while the fourth factor could be discarded.

Kim and Mueller (1978) reported factor analysis is based on the fundamental assumption that a smaller number of underlying factors are “responsible for the covariation among observed variables” (p. 12). Schmitt and Sass (2011) observed that exploratory factor analysis has long been used in the social sciences to depict the relationships between variables/items and latent traits. Costello and Osborne (2005) examined a two-year period in PsycINFO that produced over 1,700 studies that used some form of exploratory factor analysis (EFA). Over half of these studies listed principal components analysis with varimax rotation as the method used for data analysis. Varimax rotation assumes uncorrelated factors.

Promax is an oblique rotation method that allows for correlated factors. It uses the

rotated orthogonal varimax matrix and “raises the loadings to powers” (Schmitt & Sass, 2011, p. 99). Greater powers lead to larger differences between small and large factor loadings and larger interfactor correlations (Schmitt & Sass, 2011). Because of the larger interfactor correlations, the final factor solution has smaller cross-loadings and produces a simple structure for analysis. Researchers typically use rule-of-thumb cutoffs to decide if a variable “significantly” loads on a factor, with estimated standardized factor loadings of .30 to .40 indicating a meaningful or significant factor loading (Cudeck & O’Dell, 1994).

This exploratory factor analysis was conducted by a principal components analysis using a Varimax rotation method with Kaiser normalization. MacCallum, Widaman, Preacher, and Hong (2001) advised when seeking a simple factor structure, it is important to get large loadings on the primary factor and zero or near-zero loadings on the other factors. By this criterion, all 18 of the scaled items loaded distinctly with at least a .497. More importantly, none of the EO variables cross-loaded. Table 3.5 displays the factor loadings for the 18 items, six of which measured risk taking, innovativeness, and proactiveness, their corresponding Eigenvalues, percent of the variance in Total EO explained, and Cronbach’s alphas. The three factors were rotated using Varimax with Kaiser normalization. The rotation converged in five iterations. The matrix showed clear loadings on all 18 items. The Cronbach’s alphas were .89 for risk taking, .88 for innovativeness, and .73 for proactiveness, suggesting that these items would reliably and consistently measure risk taking, innovativeness, and proactiveness.

Table 3.5

Rotated Component Matrix

Item	Risk	Inn	Pro
I tend to take chances with my teaching even when the educational outcomes are uncertain.	.867		
I like to take bold actions by trying unproven teaching methods.	.832		
I like to try versions of classroom practices, which are 'long shots' at being successful.	.822		
I often commit large amounts of classroom resources to untested teaching practices.	.783		
I deviate from my school/district's curriculum even when the outcomes are uncertain.	.740		
I am willing to gamble on new instructional approaches.	.706		
I like to try innovative teaching strategies.		.805	
I embrace innovative ways of improving my teaching.		.760	
I like to develop novel teaching practices.		.740	
I enjoy creating original classroom practices.		.735	
I believe that innovation in the classroom is essential to improving teaching and learning.		.695	
I experiment with creative ways to improve upon my school/district's curriculum.		.681	
I work hard to anticipate classroom problems/barriers to learning.			.755
I tend to anticipate problems when planning new lessons.			.707
I prefer to take action as soon as possible when student results are unsatisfactory.			.677
I take preemptive action to overcome any anticipated obstacles to learning in my classroom.			.664

Rotated Component Matrix

Item	Risk	Inn	Pro
I often scan educational publications/journals/blogs to solve problems in my classroom.			.573
I like to attend workshops that demonstrate ways to solve classroom problems.			.497
Eigenvalues	5.91	3.10	1.40
% of variance	21.81	20.14	15.87
Cronbach's Alpha	.89	.88	.73

Figure 3.2 displays the component plot in rotated space and demonstrates how the series of six items converge around the three distinct factors of risk taking, innovativeness, and proactiveness. Again, this confirmed that the 18 items measured by the Teacher EO instrument were able to consistently and reliably measure risk taking, innovativeness, and proactiveness as separate factors between different populations of teachers. In this sample, risk taking had the highest Eigenvalue (5.91) and accounted for the greatest amount of variance among different populations of teachers. Risk taking also had the largest Cronbach's alpha (.89) suggesting it was the most reliable factor measured. Lastly, risk taking had the highest factor loadings of the three factors analyzed. These facts combine to suggest that risk taking may prove to be the most important EO factor for teachers of the three factors examined in this study.

Cronbach's alphas measured the internal consistency and reliability of the subscales and ranges from 0.00 to +1.00 (Hill & Lewicki, 2007). An alpha equal to 1.00 indicates perfect internal consistency reliability, while 0.00 suggests a complete absence of correlations among the items of a test i.e., no consistency (Patten, 2009). Alpha of .80

indicates that 80% of the observed variation in scores is due to real or true differences while 20% is due to measurement error (Creswell, 2008). Measurement instruments with alphas of .80 and higher are considered reliable instruments in social science (DeVillis, 2012).

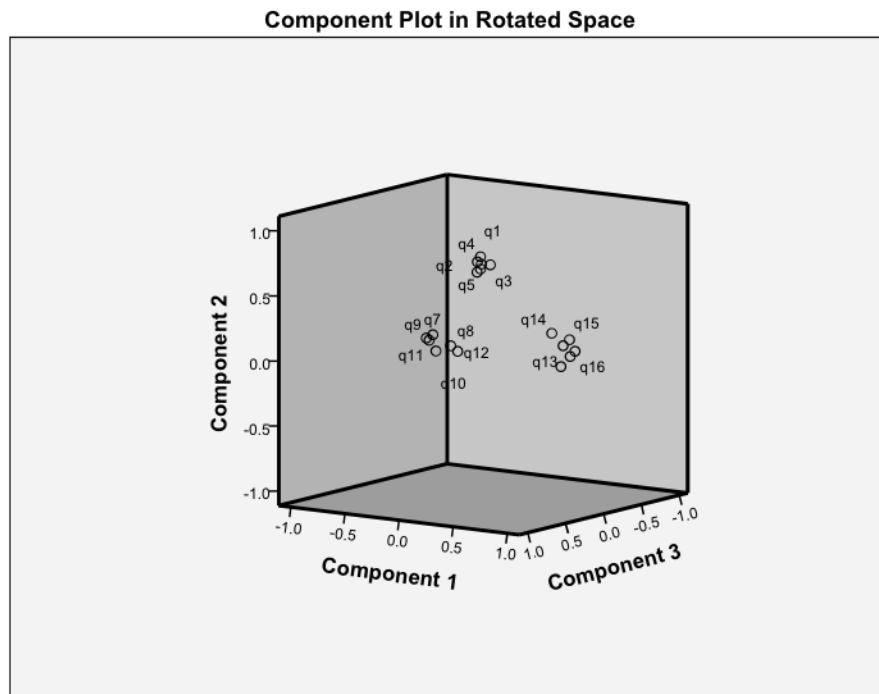


Figure 3.2. Component Plot in Rotated Space.

Data Analysis

SPSS statistical computing tools are industry standards for teaching data analysis techniques and academic research. Designed for use by research analysts working in commercial, governmental and academic organizations, SPSS software enables researchers to prepare data for analysis, develop and deploy predictive models and generate reports and graphs to display their results. Sparks (2011) reports that K-12 school districts can transform themselves using analytics, boosting academic results, and

lowering dropout rates. For example, data mining and predictive analytics create models that use second and third grade data to predict seventh grade math scores.

It is important to remember that exploratory factor analysis is in fact exploratory. It was designed for use in exploring a data set. It was not designed to test hypotheses or theories. Costello and Osborne (2005) encourage following up exploratory factor analysis with confirmatory factor analysis, which allows researchers to test hypotheses via inferential techniques. DeCoster (1998) advised using exploratory factor analysis if the researchers did not have a strong theory about constructs underlying responses to their measures. If academic researchers can measure EO factors with more precision, educational leaders may be able to identify entrepreneurial teachers and ensure greater success in implementing innovative educational reforms.

Multiple Regression Testing

Multiple regression analysis tests were run on each of the four hypotheses: (H₁) The entrepreneurial orientations of teachers in charter and private schools differ from those of traditional public school teachers along constructs of innovativeness, proactiveness, and risk taking. (H₂) The distribution of entrepreneurial characteristics among teachers varies at different types of schools. (H₃) Certain entrepreneurial characteristics are more frequently self-reported by teachers. (H₄) One sample of teachers is more disposed to innovation and risk taking than others.

Creswell (2008) describes multiple regression as a “statistical procedure for examining the combined relationship of multiple independent variables with a single dependent variable” (p. 368). The regression tables for this study are displayed in Tables 4.6-4.9. These tables display the amount of variance explained by the dependent variables

(innovativeness, proactiveness, risk taking, and total EO score) by all the independent variables (school type, level, ethnicity, gender, and years of teaching experience).

Regression coefficients are displayed in the tables. The tables also contain the standardized regression weight, or beta, which indicates the amount of contribution of each variable controlling for the variance of all other variables (Creswell, 2008). The adjusted R^2 value reports the percentage of the variance that the model accounts for. The beta weight (*Beta*) indicates the magnitude of prediction for a variable after removing the effects of all other predictors and standardizing the units. This coefficient identifies the strength of the relationship and enables a researcher to compare the strength of one predictor variable with the strength of other predictors. A large value indicates that a unit change in this predictor variable will have a large effect on the criterion variable. A large t value and small p value suggest that the predictor variable will have a large impact on the criterion variable. The ANOVA assesses the overall significance of the statistical model, which needs to be $p < .05$ for statistical significance. Brace, Kemp, and Snelgar (2000) concluded that multiple regression allows a researcher to predict someone's score on one variable on the basis of their scores on several other variables. For these reasons, multiple regression was employed to test the hypotheses and answer the research questions in this study.

Role of the Researcher

The researcher was aware that biases and assumptions about entrepreneurship could affect the project. First, the researcher assumed that educational entrepreneurship is a step toward innovation. Second, measuring the entrepreneurial orientation construct of teachers will benefit educational researchers. Thirdly, many EO related activities are

often not recognized or supported organizationally until late in the development cycle (Stopford & Baden-Fuller, 1994). Thus, organizational perception of EO innovations and initiatives may not be evident until structural and strategic failures reveal them as needed for immediate change if the organization is to survive. Fourth, educators often have a general skepticism about innovation and entrepreneurship in school reform.

Understanding how these biases can be introduced into the analysis assisted the researcher in minimizing the likelihood of such bias occurring. Without this awareness, the strength of the findings could have been compromised, which would have weakened the legitimacy of the results and conclusions of the research project.

Before administering the surveys, informed consent was obtained from the principal at the school site level. If the principal elected to participate, he or she forwarded the link to the survey application on to teachers at their school site and requested that they answer the survey during their non-contracted time. The survey processes did not cause physical or emotional harm to any of the participants. Declining to participate did not affect the principals or the teachers in any way. Participants in the study were not identified or revealed. Thus, participation did not harm the reputations or professional standing of participants. There was no monetary compensation for participating in this research. At the conclusion of the project, participants were informed that the dissertation would be published electronically and made public. The researcher has worked as a teacher in both the traditional public and charter school settings. The researcher has also participated in two start-up educational ventures. The author participated in LAUSD's Public School Choice process and is employed by LAUSD during the study. LAUSD schools were not solicited for participation in this study. The

author did not receive any financial support for the research project and declared no conflict of interest with respect to the authorship or publication of this project.

Summary

This chapter elaborated on the methods for addressing the four research questions examined by this inquiry. The investigator incorporated grounded theory development for creating a body of knowledge around entrepreneurial orientation in education and rationalized using EO as a lens to reveal precision about the factors required by entrepreneurs in education. The reasoning behind the sample selection, instrument pilot testing, data collection, and analysis techniques was described. The next chapter reports the findings of the study and presents relevant quantitative data.

Chapter IV: Results

This study of California teachers conducted item development and validation of a Teacher Entrepreneurial Orientation (TEO) instrument that could measure EO among different populations of teachers. The research then examined the entrepreneurial orientations of teachers in charter, private, and traditional public schools. This chapter will describe the research sample, outline the statistical analyses conducted on the data, and answer the research questions as well as report relevant findings in statistical form using tables, figures, and narrative. Detailed interpretation, analysis, and synthesis of the results will follow in Chapter V.

Research Questions

The main research question in this study asked: Do the entrepreneurial orientations of teachers in charter and private schools differ from traditional public school teachers along constructs of innovativeness, proactiveness, and risk taking? Subquestions investigated: (a) What was the distribution of entrepreneurial characteristics among teachers at different school levels (elementary, middle, and high)? (b) Which entrepreneurial characteristics were most frequently self-reported by teachers? (c) Was one subgroup of teachers more disposed to innovation, proactiveness, or risk taking than others?

Study Description

Exploratory factor analysis was conducted to confirm the consistency and reliability of the survey instrument. Multiple regression and analysis of variance (ANOVA) tests were run to determine the extent to which the individual factors of innovativeness, proactiveness, and risk taking were responsible for the variation among

charter, private, and traditional public school teachers. The EO factors of innovativeness, proactiveness, risk taking, and total EO score were tested as constant variables, while school type, school level, years of teaching, gender, and ethnicity were controlled. ANOVA testing was conducted to determine the statistical significance of the variation in teacher EO in the sample.

Results

This study developed an instrument to measure the entrepreneurial orientation of teachers. The instrument was used to test the following hypotheses: (H₁) The entrepreneurial orientations of teachers in charter, private, and traditional public schools differs along constructs of innovativeness, proactiveness, and risk taking. Additional hypotheses were: (H₂) The distribution of entrepreneurial characteristics among teachers varies at different levels of schools (elementary, middle, and high). (H₃) Certain entrepreneurial characteristics are more frequently self-reported by teachers. (H₄) One subgroup of teachers is more disposed to innovativeness, proactiveness, or risk taking than others.

Although this study collected demographic information on participating teachers like gender, years of teaching, ethnicity, and school level, these variables were not intended to be investigated by this study. There were no specific research questions developed to measure the variation of these variables. The statistically significant findings from this study and their contributions to the literature will be discussed in Chapter V. Table 4.1 displays the mean EO scores of teachers in charter, private, and traditional public schools.

Table 4.1

Means and Standard Deviations of Different School Types/Levels and Individual Characteristics on EO Dimensions

Variable	EO Dimensions											
	Innovative			Proactive			Risk Taking			EO Total		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
School type												
Charter	224	4.52	0.51	221	4.27	0.52	218	3.22	0.88	224	4.01	0.50
Private	151	4.54	0.68	150	4.39	0.58	148	3.09	0.89	151	4.01	0.57
Traditional public	347	4.56	0.50	344	4.41	0.49	342	2.94	0.94	347	3.98	0.49
Total	722	4.55	0.55	715	4.36	0.52	708	3.06	0.92	722	3.99	0.51
School level												
Elementary	347	4.60	0.49	344	4.43	0.47	342	2.98	0.91	347	4.01	0.48
Middle	135	4.49	0.64	134	4.32	0.69	131	3.10	0.87	135	3.99	0.55
High	240	4.49	0.55	237	4.31	0.53	235	3.16	0.93	240	3.99	0.53
Total	722	4.54	0.54	715	4.36	0.52	708	3.06	0.92	722	3.99	0.51

Table 4.1 (con't)

Means and Standard Deviations of Different School Types/Levels and Individual Characteristics on EO Dimensions

Variable	EO Dimensions											
	Innovative			Proactive			Risk Taking			EO Total		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Years of teaching												
1-5 years	122	4.51	0.52	120	4.30	0.53	120	3.17	0.91	122	4.00	0.48
6-10 years	161	4.59	0.46	161	4.33	0.47	161	3.16	0.94	161	4.03	0.50
11-15 years	141	4.49	0.51	141	4.35	0.50	140	3.00	0.88	141	3.95	0.48
16-20 years	97	4.50	0.73	94	4.36	0.48	93	3.04	0.89	97	3.94	0.59
20+ years	201	4.59	0.54	199	4.43	0.58	194	2.97	0.93	201	4.01	0.52
Total	722	4.36	0.54	715	4.36	0.52	708	3.06	0.92	722	3.99	0.51
Gender												
Female	544	4.58	0.52	538	4.43	0.48	533	3.09	0.91	544	4.04	0.48
Male	178	4.43	0.59	177	4.14	0.56	175	2.97	0.93	178	3.85	0.56
Total	722	4.54	0.54	715	4.36	0.51	708	3.06	0.92	722	3.99	0.51

Table 4.1 (con't)

Means and Standard Deviations of Different School Types/Levels and Individual Characteristics on EO Dimensions

Variable	EO Dimensions											
	Innovative			Proactive			Risk Taking			EO Total		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Ethnicity												
White	530	4.54	0.56	533	4.37	0.53	530	3.06	0.91	537	3.99	0.52
Hispanic	81	4.57	0.49	80	4.36	0.46	79	3.11	0.94	81	4.02	0.45
Asian/Pacific Islander	21	4.52	0.53	21	4.30	0.62	21	3.17	0.95	21	4.00	0.58
African American	13	4.78	0.20	13	4.50	0.44	13	3.05	1.14	13	4.11	0.48
Bi/Multi Racial	34	4.63	0.39	33	4.41	0.44	33	3.14	0.74	34	4.07	0.38
Decline to state	36	4.35	0.61	35	4.25	0.60	32	2.89	1.03	36	3.87	0.58
Total	715	4.54	0.54	715	4.36	0.52	708	3.06	0.92	722	3.99	0.51

Research Question 1

Differences on the EO subscales for the three types of schools (see Table 4.2) were compared using ANOVA. On the innovation subscale, there were no significant differences between charter, private, and traditional public school teachers (all $ps > .712$). On the proactive subscale, traditional public school teachers were significantly higher than charter school teachers ($p = .011$). Private school teachers were not significantly different from the other groups on the proactiveness subscale. On the risk taking subscale, charter school teachers scored significantly higher than traditional public school teachers ($p = .003$). Private school teachers were not significantly different from the other groups on the risk taking subscale. There were no significant differences between charter, private and traditional public school teachers on total EO score (all $ps > .705$).

Table 4.2

Teacher EO Mean Scores by School Type

School Type	Inn	Pro	Rsk	EO Total
Charter Teachers (N = 218)	4.52	4.27	3.22	4.01
Private Teachers (N = 148)	4.54	4.39	3.09	4.01
Public Teachers (N = 342)	4.56	4.41	2.95	3.98

Multiple regression analysis results. The general purpose of multiple regression analysis is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable (Hill & Lewicki, 2007). In this analysis, the dependent variable, or EO factor, was regressed on all of the predictor variables in the data

set simultaneously. Unstandardized coefficients are listed first in the regression tables, then standard error, and standardized beta.

Table 4.3

Risk Taking Multiple Regression Analysis Summary (N=708)

	B	SE	Beta
Charter school	0.21	0.08	0.11*
Private school	0.16	0.09	0.07
Middle school	0.08	0.10	0.03
High school	0.20	0.08	0.10*
Race	0.00	0.08	0.00
Years of teaching experience	-0.04	0.03	-0.06
Gender	0.18	0.08	0.09*
Constant	2.81	0.13	

Note: $R^2 = .032$; $F(7,700) = 3.32$, $p < .05$

* $p < .05$

Multiple regression analysis of risk taking revealed a Pearson's correlation coefficient R of .179, which resulted in a .032 R^2 , which could explain 3.2% of the variance in risk taking scores. The significance of $p = .002$, which is smaller than $\alpha = .05$, suggested that the multiple regression model holding risk taking as a construct was statistically valid using these predictors. Using this model, which controlled seven independent variables, four variables emerged as significant predictors: charter school teachers, $p = .011$; gender, $p = .030$; and high school teachers, $p = .014$. The implications of these findings will be discussed in Chapter V.

Table 4.4

Innovativeness Multiple Regression Analysis Summary (N=708)

	B	SE	Beta
Charter school	-0.009	0.049	-0.008
Private school	-0.008	0.054	-0.006
Middle school	-0.092	0.057	-0.066
High school	-0.079	0.048	-0.068
Race	0.005	0.047	0.004
Years of teaching experience	0.006	0.015	0.017
Gender	0.124	0.049	0.098*
Constant	4.478	0.076	

Note: $R^2 = .02$; $F(7,700) = 2.11$, $p = .041$

* $p < .05$

Multiple regression analysis of innovativeness revealed a Pearson's correlation coefficient R of .142, which resulted in a .02 R^2 , which could explain 2% of the variance in Innovation scores. The statistical significance in the ANOVA for innovation was $p = .041$. Since this was less than $\alpha = .05$, it is a statistically significant model for explaining the differences among different populations of teachers. This test showed gender to be a statistically significant predictor of EO with a $p = .012$. Specifically, female teachers scored significantly higher on innovativeness than the male teachers in this sample (see Table 4.8).

Table 4.5

Proactiveness Multiple Regression Analysis Summary (N=708)

	B	SE	Beta
Charter school	-0.099	0.046	-0.087*
Private school	-0.17	0.050	-0.013
Middle school	-0.036	0.053	-0.027
High school	-0.056	0.045	-0.051
Race	-0.006	0.044	-0.005
Years of teaching experience	0.025	0.014	0.070
Gender	0.277	0.046	0.229*
Constant	4.14	0.07	

Note: $R^2 = .08$; $F(7,700) = 8.58$, $p < .001$

* $p < .05$

Multiple regression analysis of proactiveness revealed a Pearson's correlation coefficient R of 0.280, which resulted in a .08 R^2 , which could explain 8% of the variance between in proactive scores. The significance was $p < .001$, which is smaller than $\alpha < .05$, implying that the model examining proactiveness was a statistically significant one in determining differences in proactiveness scores. This test revealed charter school teachers and gender to be statistically significant predictive variables for proactiveness. Charter school teachers had a $p = .032$ and gender was a strong predictor with a $p < .001$.

Table 4.6

Total EO Score Multiple Regression Analysis Summary (N=708)

	B	SE	Beta
Charter school	0.040	0.046	0.36
Private school	0.036	0.050	0.03
Middle school	-0.005	0.053	-0.004
High school	0.015	0.045	0.014
Race	0.012	0.044	0.010
Years of teaching experience	0.001	0.014	0.003
Gender	0.189	0.046	0.16*
Constant	3.82	0.71	

Note: $R^2 = .026$; $F(7,700) = 2.72$, $p = .009$

* $p < .05$

Lastly, multiple regression analysis was conducted on the EO total scores. The Pearson's correlation coefficient R was .161, which resulted in a .026 R^2 , which could explain 2.6% of the variance in EO scores. The significance was $p = .009$, which was smaller than $\alpha = .05$, suggesting that the EO factors in total are significant in explaining variances between different populations of teachers. In this test, only gender emerged as a statistically significant predictor variable with $p < .001$.

Research Question 2

The next hypothesis held that the distribution of entrepreneurial factors among teachers would vary at different levels of schools (see Table 4.7). Elementary school teachers ($M = 4.60$) scored .11 points higher on innovation than both middle and high school teachers

(M = 4.49). Elementary school teachers (M = 4.44) were higher on proactiveness than middle school teachers (M = 4.33) and high school teachers (M = 4.28). However, elementary school teachers (M = 2.98) were lower on risk taking than middle school teachers (M = 3.10) and high school teachers (M = 3.16). Overall, elementary school teachers (M = 4.01) scored higher on total EO score than middle school (M = 3.99) and high school teachers (M = 3.97). An ANOVA test revealed that elementary teachers were significantly higher than middle or high school teachers ($p = .027$) along the innovation subscale. Middle school and high school teachers were not significantly different ($p > .999$). The same trend applied on proactiveness. The elementary teachers' scores came in significantly higher than high school teachers ($p = .002$), while there were no significant differences between middle and high school teachers ($p = .807$). There were no significant differences in risk taking, or on the overall EO scores (all $ps > .062$).

Table 4.7

Grade EO Level Means

Grade Level Assignment	Inn	Pro	Rsk	EO Total
Elementary School (N = 342)	4.60	4.44	2.98	4.01
Middle School (N = 131)	4.49	4.33	3.10	3.99
High School (N = 235)	4.49	4.28	3.16	3.97

Research Question 3

The third hypothesis held that certain entrepreneurial factors would be more frequently self-reported by teachers. Overall, the teachers in this study reported a mean risk taking score of 3.06, a mean proactiveness score of 4.36, and a mean innovation score of

4.55. An ANOVA was conducted to determine if the differences in the means were statistically significant. All teachers reported significantly higher levels of innovation than proactiveness. All teachers reported significantly higher levels of innovation than risk taking. All teachers reported significantly higher levels of proactiveness than risk taking (all $ps < .001$).

Research Question 4

The final hypothesis held that one subgroup of teachers would be more disposed to innovation and risk taking than others. Table 4.8 displays the EO means by gender. The multiple regression analysis showed that gender had a significant effect on all three subscales and the overall EO score. Further ANOVA testing revealed that females reported a higher overall EO score and significantly higher levels of innovation and proactiveness (all $ps < .02$). There was no significant difference in risk taking ($p = .140$).

Table 4.8

EO by Gender

Gender	Inn	Pro	Rsk	EO Total
Male (N = 175)	4.43	4.14	2.97	3.85
Female (N = 533)	4.58	4.44	3.09	4.04

ANOVA analysis indicated that there were no significant differences in EO levels by ethnicity (all $ps > .154$).

Table 4.9

EO by Ethnicity

Ethnicity	Inn	Pro	Rsk	EO Total
White (N = 530)	4.54	4.37	3.06	3.99
Non-White (N = 178)	4.55	4.35	3.08	4.00

Table 4.10 displays EO means by years of experience. Results of ANOVA found no significant differences on the overall EO score, or any subscale (all $ps > .182$).

Table 4.10

EO by Experience

Years Teaching	Inn	Pro	Rsk	EO Total
1-5 years (N = 120)	4.51	4.30	3.17	4.00
6-10 years (N = 161)	4.59	4.34	3.16	4.03
11-15 years (N = 140)	4.49	4.35	3.00	3.95
16-20 years (N = 93)	4.05	4.36	3.04	3.94
20+ years (N = 194)	4.58	4.43	2.97	4.01

Summary

Results from this study of California teachers showed significant differences in innovation, proactiveness, and risk taking. Gender was the only variable that had a statistically significant effect on overall EO scores. Female teachers scored significantly higher than males on the innovation and proactiveness subscales and total EO score.

Traditional public school teachers had higher scores on the proactiveness scale than the charter school teachers. Charter school teachers scored significantly higher than traditional public school teachers on risk taking. There were significant differences between elementary school and high school teachers along innovation and risk taking, with elementary teachers scoring higher on innovation and high school teachers scoring higher on risk taking. The next chapter will discuss the implications of these findings for future researchers.

Chapter V: Discussion and Conclusions

This quantitative study of California teachers adapted an Entrepreneurial Orientation instrument, which has been widely used in management research, to determine whether teachers in charter, traditional public, and private schools differed along scales of innovativeness, proactiveness, and risk taking. This blended items from previously published scaled EO instruments developed by Lumpkin et al. (1996; 2000; 2009); Bateman and Crant (1993); Bolton and Lane (2011); Eyal and Inbar (2003); and Miller/Covin and Slevin (1989). Data from this sample found no statistically significant differences within the innovativeness and proactiveness dimensions, yet significant differences among charter school teachers, private school teachers, female teachers, and high school teachers along the risk taking domain.

This chapter will interpret and discuss the results of the study in detail. After summarizing the statement of the problem, research questions, and methodology, the chapter will discuss the results in relation to the literature, provide recommendations for policy and practice, and suggest future directions for subsequent EO research in the education sector.

Statement of the Problem

Entrepreneurs in education have been investigated by numerous researchers: (Childress, 2010; Hess, 2006; 2008; 2009, 2010; Lake, 2008; Lubienski, 2003; 2009). These researchers have argued that despite formidable challenges, entrepreneurs in education have increased efforts to systemically change public education. Many policy makers see innovation as a discipline and lever for change in public education (Hess, 2008). Capitalizing on the high level of interest in the educator as an entrepreneur, this researcher theorized that as large-scale institutional change in education builds, educational leaders should examine

the entrepreneurial orientations of the teachers who will shoulder most of the burden in implementing new programs. This study provides a base for educational researchers to begin classifying the entrepreneurial aptitudes of teachers. Additional research may find that teachers who have high entrepreneurial orientations may be better suited to implementing innovative programs.

Purpose Statement

Hill and Campbell (2011) stated the number of districts employing portfolio management strategies has increased nationally from four in 2008 to 24 in 2011. The portfolio management model of school governance emphasizes market principles, expanded choice, and a smaller central office overseeing semi-autonomous networks of schools (Pennsylvania Clearinghouse for Education Research (PACER), 2012). Resources are “redirected from under-enrolled or low-achieving schools toward higher-performing or improving schools through the increased use of school choice and closure policies” (PACER, 2012, p. 4). New start-up schools are typically small (Gross, Fruchter, & Simmons, 2012). Many start with only one or two grade levels and demonstrate promise in their educational model before scaling up and adding additional students (Hemphill, Nauer, Zelon, & Jacobs, 2009). As these schools have fewer administrators, they require teachers who can work with minimal supervision and less intervention from management (Nadelstern, 2012).

Teachers were chosen as the focus of this study because they are analogous to middle managers in business wherein they directly supervise or “manage” between 20-220 students or “employees” on a daily basis. Since there are a variety of school choices in California, the sample was further subdivided into three categories of charter, private, or traditional public school teachers.

Rauch et al. (2009) conducted a meta-analysis that suggested that entrepreneurial orientation is a significant predictor of firm performance. Since the EO construct has been empirically studied for 40 years, it stands to reason that incorporating EO research into education may benefit educational start-ups by identifying teacher candidates who score highly along the three EO domains of risk taking, innovativeness, and proactiveness. High scores along these domains may indicate that a teacher is entrepreneurial enough to solve classroom problems as they arise and improve teaching and learning practices with minimal oversight from management.

Research Questions

The main research question in this study asked: Do the entrepreneurial orientations of teachers in charter and private schools differ from traditional public school teachers along constructs of, innovativeness, proactiveness, and risk taking? Subquestions investigated: (a) What was the distribution of entrepreneurial characteristics among teachers at different school levels (elementary, middle and high)? (b) Which entrepreneurial characteristics were most frequently self-reported by teachers? (c) Was one subgroup of teachers more disposed to innovation, proactiveness, or risk taking than others?

This study hypothesized that (H₁) The entrepreneurial orientations of teachers in charter and private schools differ from those of traditional public school teachers along constructs of innovativeness, proactiveness, and risk taking. Additional hypotheses were: (H₂) The distribution of entrepreneurial characteristics among teachers varies at different grade levels of schools (elementary, middle and high). (H₃) Certain entrepreneurial characteristics are more frequently self-reported by teachers. (H₄) One subgroup of teachers is more disposed to innovation, proactiveness, or risk taking than others.

Methodology

This study applied lessons learned from decades of research on the entrepreneurial orientation construct to create an instrument sensitive enough to measure degrees of difference in the entrepreneurial orientations of teachers. This inquiry built on the work of Eyal and Inbar (2003) who demonstrated a two-dimensional model of school entrepreneurship. This research adapted scaled EO instruments used by Lumpkin et al. (1996; 2000; 2009) to broaden the model into a three-dimensional construct of risk taking, innovativeness, and proactiveness. Extensive pilot testing was done to ensure the instrument was suitable for use with educators. Items related to the proactive personality construct were tailored from Bateman and Crant (1993). The Miller/Covin and Slevin (1989) scale was used to adapt items measuring innovativeness, proactiveness, and risk taking. Additional innovation items for public schools were developed from Eyal and Inbar (2003). Further items were generated from an individual entrepreneurial orientation scale validated by Bolton and Lane (2011). Extensive pilot testing resulted in the final instrument (Appendix C) containing 18 items, and utilizing a five point Likert scale, ranging from 1 = very untrue of me to 5 = very true of me. A total of six items were used to measure differences between teachers in each of the three EO domains of innovativeness, proactiveness, and risk taking.

This study used publicly accessible school contact information from the state of California's Department of Education web page. The email addresses of school principals were collected from the databases and separated into three Excel files: charter, private, and traditional public. Principals were randomly selected, then imported into a third party email marketing client, and sent a customized email solicitation, which they could forward on to their teachers. All teacher responses were collected anonymously. Neither school district

performance levels, nor individual school data were requested for this study. The 729 responses to the EO survey were collected within five days of the initial email solicitation being sent.

Summary of Findings

This sample was generalizable within the state of California. Exploratory factor analysis was conducted on this data and the eigenvalues of the three factors of risk taking, innovativeness, and proactiveness were examined. Risk taking accounted for 22% of the variance of EO. Innovativeness accounted for 20% of the variance of EO. Proactiveness accounted for 16% of the variance of EO. These factors combined accounted for 58% of the total variance. Multiple regression analysis and ANOVAs were conducted on 708 completed responses. Statistical averaging was done on incomplete surveys in SPSS to increase the total sample size to 729. Separate tests were run for risk taking, innovativeness, proactiveness, and total EO score. Each test controlled seven variables. These regressions showed statistically significant differences in the EO levels of charter, private, female and high school teachers, along the risk taking domain. There was no statistically significant variation among teachers in charter, private, or traditional public schools along the innovativeness and proactiveness domains.

Discussion

This next section will discuss the results in relation to the study's research questions and reviewed literature.

Research Question 1

The first research question in this study asked if the entrepreneurial orientations of teachers in charter, private, and traditional public schools differ along constructs of

innovativeness, proactiveness, and risk taking. ANOVA revealed no statistically significant differences between the three groups along the innovativeness subscale. Traditional public school teachers scored significantly higher than charter school teachers on proactiveness. Charter school teachers scored significantly higher than traditional public school teachers on risk taking. Private school teachers were not significantly different from charter school teachers, or traditional public school teachers on either of these subscales.

This study revealed no statistically significant difference in innovativeness scores between all three groups of teachers. Charter schools and private schools are often perceived as being more innovative than traditional public schools (Broughman et al., 2011; Lake, 2008), yet these scores did not reflect this. Payne (2013) hypothesized that charter school autonomy has failed to produce innovation or improve student achievement, and that “the evidence on charter school teacher turnover and lack of job security may explain some of the lack of difference in student achievement between charter schools and traditional public schools” (p. 22). The data in this study is consistent with Payne’s hypothesis.

There was a significant difference between traditional public school teachers and charter school teachers on proactiveness. Proactive behavior is described as how workers passively withdraw or actively try to change working conditions as they adapt to dissatisfying work environments (Bateman & Crant, 1993). This may suggest that unionized teachers in the traditional public school sector feel more comfortable advocating for their students. This implies that if teachers who scan for opportunities, show initiative, take action, and persevere until change occurs are needed at start up schools, they may require some protection from collective bargaining agreements. This finding is supported by Crant and Bateman, 2000 who found a positive association between proactive personality and

supervisors' perceptions of leadership. An extensive body of research (Crowther, Ferguson, & Hann, 2009; Darling-Hammond, 2000; Farris-Berg et al., 2013; Markow et al., 2012; Schmoker, 2011) confirms that teacher leadership is essential for improving schools.

There was also a significant difference between traditional public school and charter school teachers along the risk taking subscale. The finding that charter school teachers scored significantly higher than traditional public school teachers is a significant finding worthy of further inquiry. Seniority-based hiring practices employed by unionized public schools discourage mobility within schools and districts (Moe, 2011). This factor may explain why traditional public school teachers in this study scored lower along the risk taking subscale. Perhaps additional research should be conducted on charter school teachers who score high on the risk taking domain to see if they coincide with other job satisfaction factors. Perhaps charter school teachers who report high risk taking scores should be examined for correlation with student achievement factors.

This suggests that educational researchers examining the entrepreneurial orientations of teachers should thoroughly investigate the risk taking domain. Qualitative researchers should investigate how teachers describe and experience instances of risk taking within their district, schools and classrooms. Further quantitative inquiry should be done to see if teachers with high risk taking attributes have any relationship to increases in student achievement.

Research Question 2

The second research question asked what the distribution of entrepreneurial characteristics was among teachers at different school levels (elementary, middle, and high). In examining the means and conducting multiple regression analysis, there were significant differences between elementary school and high school teachers along the subscales of

innovation and proactiveness. Possible reasons for this finding may lie within the California state teacher credentialing system that distinguishes between multiple subject and single subject credentials. These teachers have different motivations for entering the profession, different backgrounds, and different training. More research needs to be conducted to explore the differences in innovation and proactiveness with different levels of teachers.

Research Question 3

The third research question asked which entrepreneurial characteristics were most frequently self-reported by teachers. The mean scores of the individual EO factors (see Table 4.1) indicate that innovativeness was the most frequently reported EO characteristic with a mean of 4.54, followed by proactiveness with a mean of 4.36, and then risk taking with a mean of 3.09. These significant differences may indicate that the EO constructs of innovativeness, proactiveness, and risk taking are distinct constructs within the entrepreneurial orientation of teachers and may be examined independently. This may indicate that teachers like to think of themselves as innovative and they don't believe that a high degree of risk taking is necessary for innovation. Lake (2008) suggests that market incentives drive the demand for innovation and that policy makers should be more specific and targeted in their innovation goals. This finding confirms that more research should be done on innovation in education, particularly in linking innovative practices to higher levels of student achievement and in determining what types of policy environments contribute to innovation.

Research Question 4

The final research question asked whether one subgroup of teachers was more disposed to innovativeness, proactiveness, or risk taking than others. While there were no

statistically significant variations in risk taking, females reported a higher overall EO score and significantly higher levels of innovation and proactiveness. There is considerable debate in the educational research community on the effects of gender. Carrington, Francis, Hutchins, Skelton, and Read (2007) found that the gender of teachers had little effect on the academic motivation and engagement of both boys and girls. Students reported the gender of the teacher was immaterial and they valued teachers who were consistent and even-handed and supportive of them as learners. Although this study did not intend to investigate the effect of gender on teacher EO, this significant finding cannot be ignored.

The entrepreneurial orientation literature presents mixed results when it comes to examining the effects of gender. Runyon, Huddleston, and Swinney (2006) found that although women reported higher levels of entrepreneurial orientation, consistent with the findings in this study, there were no differences in their abilities to achieve firm performance. In the present study, female teachers expressed significantly higher levels of innovativeness and proactiveness than their male colleagues. If the relationship between female entrepreneurs and improved firm performance is analogous to a potential relationship between female teachers and improved student achievement, then further investigation is warranted. Of course, this may lead to the discovery that although female teachers express higher levels of EO, the results may not translate into higher student achievement.

Thus, while this study reveals that female teachers scored significantly higher on innovativeness and proactiveness than their male counterparts, it does not suggest that female teachers are superior. This finding may suggest that female teachers are more suited to educational start ups than male teachers. Without resorting to rampant speculation, this

finding suggests that more research should be conducted on the confluence of EO and gender in education.

Implications for Practice

Nadelstern (2012) noted that portfolio management is an emerging strategy in public education, where school districts manage a portfolio of diverse schools that are provided through traditional district operation, charter operators, and nonprofit organizations, and hold all schools accountable for performance. At this writing, portfolio districts include Austin, Baltimore, Boston, Central Falls, Chicago, Cincinnati, Cleveland, Denver, Detroit, District of Columbia, Hartford, Indianapolis, Jefferson Parish, Los Angeles, Milwaukee, Minneapolis, Nashville, New Haven, New Orleans, North Forest, New York City, Oakland, Philadelphia, Rochester, Spring Branch, and Tennessee Achievement School District. These districts represent new opportunities for nascent educational entrepreneurs and may provide numerous cases for educational researchers to observe small start up schools and subsequent success rates. In fact, these districts could be incubators for future inquiry involving the entrepreneurial orientation construct in the education setting.

Researchers studying the portfolio management model in twenty-three cities reported that district schools have experienced significant operational challenges stemming from the shift to portfolio management (Hill, 2011). Marsh et al. (2011) warned that districts may experience management difficulties in implementing organizational change in the shift to portfolio management. Honig and DeArmond (2010) noted difficulties in maintaining supply and problems engaging parents and the community in sustaining these reforms. Lake and Hill (2009) suggested the creation of new departments for portfolio management. Indeed, a growing body of research indicates that district offices often require restructuring to remain

neutral in providing support for newly autonomous schools (Honig & DeArmond, 2010; Lake & Hill, 2011).

Hemphill et al. (2009) conducted 18 months of investigation in NYC small schools of choice, examining the performance of 200 start up schools. They reported that leading a new small school is more difficult than leading a large, well-established school and acknowledged that new, small schools are fragile and require substantial attention if the city [District] is to ensure early gains do not unravel as years go by. Small schools also have a higher rate of teacher turnover than large schools. Ingersoll (2001, as cited by Hemphill et al. 2009) found large urban schools serving mostly poor students had an annual turnover rate of 19% in 2000–01, while small urban schools serving poor students had a turnover rate of 26%. Further, this turnover may be more disruptive in a small school than in a large school, since it is occurring in a “fragile” environment and it may lead to decreased staff morale and increased educational start up failure.

Thus, teacher EO examination may provide portfolio managed districts with a cost effective method in identifying educational leaders and instructional talent who are more likely to be successful in start-up schools. Investigating risk taking, in particular, may give human resource screeners another data point to consider when they evaluate candidates. Clearly, more research is needed to identify factors that cause teachers to leave educational start ups. Do these teachers go back to large, comprehensive schools? Do they move onto other districts where reform efforts are less disruptive? Do they leave teaching altogether? Nadelstern (2012) found that creating an environment conducive to innovation would result in accountable, creative, and decisive individuals beating a path to your door. Thus, it is

feasible that additional EO inquiry in the education sector may help educational leaders increase the success rates of small, start up schools.

Limitations of Study

This study used an adapted version of an Entrepreneurial Orientation construct. Scaled EO survey instruments have been the focus of 40 years of research. However, the original intent of the instrument was designed to measure the entrepreneurial orientation of businesses and compare the differences in entrepreneurial attitudes of firms competing in the same market. While Bolton and Lane (2011) validated an individual entrepreneurial orientation (IEO) instrument, there is minimal evidence of scaled instruments being used for measuring the Entrepreneurial Orientations of individuals, much less teachers. Since the original intent of an EO scaled instrument was to compare the entrepreneurial orientation constructs of for-profit corporations within a marketplace, there may be questions about its appropriateness for measuring the entrepreneurial affects orientations of teachers.

Further, subsequent researchers may discover that there may not have been sufficient instrument sensitivity in the domains of innovativeness and proactiveness. A design element in the online survey delivery system measured the three domains in sequence with innovativeness first, then proactiveness, and finally risk taking. Most respondents self reported very high scores for innovation with a mean of 4.54, and similarly high scores for proactiveness with a mean of 4.36. The self reported risk taking scores had a lower mean of 3.09, which was significantly different from the other two domains.

Although 97% of all 729 respondents completed the survey, the majority of the approximately 3% or 22 respondents that did not finish the survey ended their responses during the risk taking section. This suggests that response fatigue may have set in when

respondents got to the risk taking section, or that the risk taking items did not accurately reflect what these teachers perceived to be risk taking behavior. This may account for lower self reported scores in the risk taking domain. Future research using this instrument should scramble the items to ensure that differing sequences do not produce different results. In addition, further qualitative research should be conducted to learn more precisely what teachers define as risk taking behavior.

Of course, there may be additional factors outside the realms of innovativeness, proactiveness, and risk taking that contribute to differences in teachers in educational start ups, however, those factors were not investigated, or measured by this study. Demographic differences such as years of experience in the teacher population at start up charters and private schools may effect school performance. Lastly, online survey research tends to be completed by subjects who are more educated, more affluent, and predominantly female (Dillman, Smith, & Christian, 2009). This recruiting method may have resulted in surveying subjects who may have been more innovative, proactive, or inclined to take risks than those who would participate via traditional mail and phone surveying methods. While using the internet to recruit teachers for an online, web-based survey was a cost effective means to gather a large number of respondents, future researchers with more resources may wish to employ multiple means of recruiting respondents.

Recommendations for Future Research

Pilot testing for this study indicated that teachers have difficulty identifying certain EO concepts like autonomy and competitive aggressiveness. Risk taking later emerged as an important factor in both the exploratory factor analysis validating the survey instrument and in the multiple regression analysis that predicted which EO factors were most significant.

Thus, more research needs to be done to find out how teachers define, perceive, and engage in risk taking in their classroom practices. Further studies should examine whether a relationship exists between risk taking teachers and higher student achievement. Also, since the dimensions of innovativeness and proactiveness had very little variation among different populations of teachers, more research should be done on those factors with regards to instrument sensitivity. A few researchers (Dunn, 1989; Leroux, Rizzo, & Sickles, 2012; Mayer et al., 2007) have noted survey instruments that rely on self-reporting subjects may contain bias. Thus, using a supervisor or peer observer to rate teachers along dimensions of innovativeness, proactiveness, and risk taking may yield different results and implications.

Linking EO to student achievement scores may be an essential next step in this line of research. Fine-tuning the Teacher EO instrument for greater sensitivity would also be a worthwhile endeavor. George and Marino (2011) suggested the accumulation of EO knowledge would best be facilitated by conceptualizing EO as a reflective model utilizing three dimensions. They encouraged researchers to apply EO in new cases and organizational settings through *concept travelling*, which “entails increasing the extension of a concept” (p.994). This study has demonstrated that EO research may concept travel well into the education sector, particularly in areas where educational leaders are implementing entrepreneurial, market-based strategies. Districts implementing a portfolio management model, instructional leaders recruiting for small start up schools, and educational entrepreneurs deploying game changing innovations are just a few of the many areas where educational stakeholders may benefit from understanding how EO as a construct, as well as the individual factors of innovativeness, proactiveness, and risk taking may impact their practices and procedures.

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Appendix A

Dear Principal:

Your school has been randomly selected for participation in a research project from the State of California's database of charter schools. I am a high school principal and doctoral student in Los Angeles and would like your assistance in distributing my online questionnaire to teachers. My research investigates whether teachers in charter, private, or traditional public schools differ along scales of innovativeness, proactiveness, and risk taking.

For this study, I have adapted an Entrepreneurial Orientation instrument, which has been used in Management theory and research for over 30 years. Completing this will only require about 5 – 10 minutes of time. I would appreciate it if you would forward my 18-item survey to your teachers and encourage them to participate during their non-contracted time.

<https://www.surveymonkey.com/s/EOweb>

This study has been approved by California State University Northridge's Institutional Review Board and poses no danger to human subjects. If you have questions, concerns, or comments about this research project, you may contact the following:

1. Mr. Scott Petri (Principal Researcher) via email at scott.petri.75@my.csun.edu
2. Dr. Richard Castallo (Faculty Advisor) via email at richard.castallo@csun.edu

Thank you for your time and consideration.

Scott Petri

Appendix B

Table B.1

November 2012 Autonomy Domain Items (N = 41)

Item	Autonomy	Innovativeness	Proactiveness	Risk Taking	Competitive Aggressiveness
I prefer to lesson plan alone.	93.5	0	0	0	6.5
I prefer to operate/work without frequently consulting with a supervisor.	87.9	0	3	9.1	0
I prefer to create my own lessons and curriculum.	60	25.7	8.6	5.7	0
I prefer to use district-created or publisher-created lessons and curriculum, as opposed to those I have developed myself.	43.3	13.3	10.0	26.7	6.7
I prefer to design my own methods of instruction.	47.1	38.2	5.9	0	8.8
I am a more effective teacher when I set my own goals and objectives.	75.8	12.1	9.1	3.0	0

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.2

November 2012 Innovativeness Domain Items (N = 41)

Item	Autonomy	Innovativeness	Proactiveness	Risk Taking	Competitive Aggressiveness
I experiment with new methods from professional development.	9.1	33.3	21.2	36.4	0
I actively seek out new ways of changing the teaching in my classroom.	0	51.4	37.1	11.4	0
I play a major role in identifying and selecting the learning opportunities my school/department pursues.	2.8	19.4	52.8	5.6	19.4
I prefer to experiment with new classroom practices.	5.6	50	5.6	38.9	0
I prefer to adapt methods that other teachers have developed.	19.4	38.7	16.1	9.7	16.1
I have discovered, developed or implemented many of the new practices and procedures currently in use at my school.	8.6	34.3	28.6	5.7	22.9

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.3

November 2012 Proactiveness Domain Items (N = 41)

Item	Autonomy	Innovativeness	Proactiveness	Risk Taking	Competitive Aggressiveness
I introduce novel ideas and practices to my colleagues.	6.1	45.5	21.2	18.2	9.1
I directly question pedagogical choices I know are flawed.	15.6	12.5	21.9	37.5	12.5
I am often the first teacher at my school to try new educational delivery products and materials.	3.0	27.3	24.2	21.2	24.2
I recognize good teaching methods that will benefit my students.	32.4	14.7	47.1	2.9	2.9
Teachers at my school eventually replicate to changes I have made in my classroom.	6.1	24.2	21.2	3	45.5
I can improve my students' test scores by making different pedagogical choices.	17.6	23.5	38.2	17.6	2.9

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.4

November 2012 Risk Taking Domain Items (N = 41)

Item	Autonomy	Innovativeness	Proactiveness	Risk Taking	Competitive Aggressiveness
I prefer doing classroom projects that take students 1-2 days to complete.	50	23.3	13.3	10	3.3
I elect to make gradual changes in my classroom practices and curriculum.	35.3	17.6	26.5	20.6	0
I choose classroom projects that take weeks or longer for students to complete.	10.7	46.4	17.9	14.3	10.7
I often choose to implement initiatives that are different from those my school has used in the past.	17.1	40	5.7	37.1	0
I am likely to use new products, services, and techniques after I have seen another teacher using them successfully.	22.6	35.5	16.1	22.6	3.2
I deviate from my school/district's curriculum when making teaching decisions in my classroom.	28.6	17.1	2.9	51.4	0

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.5

November 2012 Competitive Aggressiveness Domain Items (N = 41)

Item	Autonomy	Innovativeness	Proactiveness	Risk Taking	Competitive Aggressiveness
Students in my classes often outperform the students in other teachers' classes.	3.1	3.1	9.4	0	84.4
I create better learning opportunities in my classes when compared to other teachers at my school.	6.3	12.5	15.6	3.1	62.5
I regularly conduct student contests in my classroom.	17.2	10.3	0	27.6	44.8
Students in my classes do more work than the students in other teachers' classes.	3.2	0	12.9	3.2	80.6
I use more of what are known as best practices in my classroom than most of my colleagues.	20.6	8.8	29.4	8.8	32.4
I enjoy debating with other teachers when discussing best practices.	0	8.6	20	5.7	65.7

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.6

December 2012 Innovativeness Item Test (N = 72)

Item	Aut	Inn	Pro	Rsk	Cmp
I actively try new ways of improving the teaching in my classroom.	9.7	41.7	31.9	11.1	5.6
I enjoy experimenting with ways to create new classroom practices.	18.3	40.8	16.9	21.1	2.8
I have discovered/developed/implemented many of the new practices/procedures currently in use at my school.	17.8	28.8	26.0	9.6	17.8
I like to try novel teaching strategies.	14.7	40.0	16.0	26.7	2.7
I prefer instructional approaches that have been used before.	41.1	13.7	26.0	11.0	8.2
I favor experimenting with atypical teaching/learning approaches rather than using methods others generally use.	16.4	39.7	11.0	30.1	2.7
I find ways to improve upon my school/district's curriculum when making teaching decisions in my classroom.	26.8	32.4	28.2	9.9	2.8
I believe that dramatic changes are needed to improve traditional methods of teaching and learning.	12.7	36.6	22.5	23.9	4.2

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.7

December 2012 Proactiveness Item Test (N = 71)

Item	Aut	Inn	Pro	Rsk	Cmp
I enjoy overcoming obstacles to learning in my classroom.	22.2	23.6	37.5	9.7	6.9
I am constantly on the lookout for new ways to improve my instruction.	15.3	34.7	33.3	9.7	6.9
I am often among the first to recognize good teaching methods that will engage today's students.	15.1	32.9	28.8	16.4	6.8
I prefer to implement/pioneer new instructional approaches before others.	15.3	26.4	20.8	27.8	9.7
I excel at identifying new learning opportunities for my students.	12.7	42.3	28.2	7.0	9.9
I frequently think about how classroom teaching will evolve in the future.	16.4	42.5	28.8	8.2	4.1
I often scan educational publications/professional journals/teacher blogs to solve problems in my classroom.	16.7	20.8	48.6	8.3	5.6
I work hard to anticipate classroom problems/needs/changes.	13.5	18.9	60.8	2.7	4.1
I tend to plan ahead/anticipate problems when teaching new units.	16.4	21.9	56.2	2.7	2.7
I prefer to "step up" and get things going when student results are unsatisfactory.	19.7	18.3	40.8	5.6	15.5

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.8

December 2012 Risk Taking Item Test (N = 71)

Item	Aut	Inn	Pro	Rsk	Cmp
I seldom make significant changes in my classroom practices.	37.5	13.9	16.7	23.6	8.3
I often choose teaching techniques that are different from those that have been used at my school in the past.	11.1	47.2	16.7	22.2	2.8
I am willing to gamble on new instructional technologies/materials before they are shown to be effective by extensive research.	12.7	14.1	16.9	50.7	5.6
I deviate from my school/district's curriculum when making teaching decisions in my classroom.	23.6	19.4	16.7	31.9	8.3
I devote large amounts of classroom resources to new teaching practices.	11.0	53.4	12.3	13.7	9.6
I like to take bold actions when teaching by venturing into the unknown.	12.5	23.6	13.9	40.3	9.7
I am willing to invest a lot of instructional time on something that may or may not yield good results for my students.	15.3	12.5	12.5	54.2	5.6
I tend to take chances with my teaching even when the educational outcomes are uncertain.	16.7	20.8	9.7	51.4	1.4
I typically adopt a cautious,					

“wait-and-see” posture when considering curriculum changes to minimize the probability of making a costly decision.	45.2	15.1	15.1	20.5	4.1
I believe it is best to make incremental/gradual changes to curriculum.	29.6	26.8	26.8	12.7	4.2

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.9

January 2013 Innovativeness Item Test (N = 54)

Item	Inn	Pro	Rsk
I embrace innovative ways of improving my teaching.	68.5	29.6	1.9
I enjoy creating original classroom practices.	66.7	24.1	9.3
I have helped develop many creative programs currently in use at my school.	59.3	33.3	7.4
I like to develop novel teaching practices.	63	29.6	7.4
I enjoy experimenting with different teaching and learning approaches.	61.1	22.2	16.7
I often try out creative ways to improve upon my school/district's curriculum	61.1	33.3	5.6
I like to try innovative teaching strategies.	64.8	25.9	9.3
I believe that innovation in the classroom is essential to improving teaching and learning.	75.9	16.7	7.4
I frequently depart from traditional methods of teaching and learning.	51.9	25.9	22.2

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.10

January 2013 ProactivenessItem Test (N = 54)

Item	Inn	Pro	Rsk
I take preemptive action to overcome any anticipated obstacles to learning in my classroom.	24.1	72.2	3.7
I am constantly on the lookout for emerging opportunities to improve my instruction.	40.7	53.7	5.6
I take the initiative to investigate emerging instructional approaches every year.	38.9	51.9	9.3
I often scan educational publications/journals/blogs to solve problems in my classroom.	33.3	61.1	5.6
I like to attend workshops that demonstrate ways to solve classroom problems.	25.9	64.8	9.3
I work hard to anticipate classroom problems/barriers to learning	20.4	75.9	3.7
I tend to anticipate problems when planning new lessons.	13	79.6	7.4
I prefer to take action as soon as possible when student results are unsatisfactory.	20.4	74.1	5.6

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.11

January 2013 Risk Taking Item Test (N = 54)

Item	Inn	Pro	Rsk
I am willing to gamble on new instructional approaches before they are shown to be effective.	29.6	20.4	50
I deviate from my school/district's curriculum even when the outcomes are uncertain.	20.4	24.1	55.6
I often commit large amounts of classroom resources to uncertain teaching practices.	27.8	18.5	53.7
I like to take bold actions by trying unproven teaching methods.	20.4	24.1	55.6
I am willing to invest a lot of instructional time on something that may or may not yield good results.	25.9	24.1	50
I tend to take chances with my teaching even when the educational outcomes are uncertain.	20.4	24.1	55.6
I like to try versions of classroom practices, which are 'long shots' at being successful.	20.4	25.9	53.7
I am willing to risk failure when trying a new teaching practice with great potential.	22.2	29.6	48.1

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.13

February 2013 Innovativeness Item Test (N = 54)

Item	Inn	Pro	Rsk
I embrace innovative ways of improving my teaching.	72.2	20.4	7.4
I enjoy creating original classroom practices.	68.5	20.4	11.1
I like to develop novel teaching practices.	55.6	31.5	13
I like to try innovative teaching strategies.	64.8	22.9	13
I believe that innovation in the classroom is essential to improving teaching and learning.	68.5	18.5	13

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.14

February 2013 ProactivenessItem Test (N = 54)

Item	Inn	Pro	Rsk
I take preemptive action to overcome any anticipated obstacles to learning in my classroom.	22.2	68.5	9.3
I like to attend workshops that demonstrate ways to solve classroom problems.	27.8	63	9.3
I work hard to anticipate classroom problems/barriers to learning	22.2	66.7	11.1
I tend to anticipate problems when planning new lessons.	20.4	68.5	11.1
I prefer to take action as soon as possible when student results are unsatisfactory.	27.8	61.1	11.1

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Table B.15

February 2013 Risk Taking Item Test (N = 54)

Item	Inn	Pro	Rsk
I am willing to gamble on new instructional approaches before they are shown to be effective.	20.4	25.9	53.7
I am willing to deviate from my school/district's curriculum even when the outcomes are uncertain.	44.4	18.5	37
I am willing to commit large amounts of classroom resources to uncertain teaching practices.	25.9	25.9	48.1
I am willing to take bold actions by trying unproven approaches.	27.8	14.8	57.4
I am willing to take chances with my teaching even when the educational outcomes are uncertain.	31.5	20.4	48.1
I am willing to try classroom practices, which are 'long shots' at being successful.	37	13	50

Note: Numbers represent the percentage of pilot participants who assigned the item to the EO domain.

Appendix C

Final Teacher Entrepreneurial Orientation Instrument

1. Participant Information

The purpose of this research is to measure the entrepreneurial orientation of different populations of school teachers. You will be given 18 items. Please rate the level at which you agree with the item.

Your participation is completely voluntary and confidential. There are absolutely no consequences for not participating in this research project. If you begin participating and change your mind you may end your participation at any time without negative consequences; simply cease taking the online survey. Your identity is not being collected and will not be disclosed.

* 1. I have _____ years of teaching experience.

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 20+ years

* 2. I presently teach at the _____ level.

- Elementary School
- Middle School
- High School

* 3. I currently teach at a _____ school

- Private
- Traditional Public
- Charter

* 4. My gender is _____.

- Male
- Female

* 5. My ethnicity is _____.

- White
- Hispanic
- Asian/Pacific Islander
- African American
- Bi/Multi Racial
- Decline to state

2. EO Final Instrument

This instrument measures teachers along dimensions of Innovativeness, Proactiveness, and Risk Taking. Please read each item and choose the response that represents your level of agreement with the item.

* 6. I embrace innovative ways of improving my teaching.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 7. I enjoy creating original classroom practices.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 8. I like to develop novel teaching practices.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 9. I like to try innovative teaching strategies.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 10. I believe that innovation in the classroom is essential to improving teaching and learning.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 11. I experiment with creative ways to improve upon my school/district's curriculum.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

3. EO Final Instrument

This instrument measures teachers along dimensions of Innovativeness, Proactiveness, and Risk Taking. Please read each item and choose the response that represents your level of agreement with the item.

* 12. I take preemptive action to overcome any anticipated obstacles to learning in my classroom.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 13. I like to attend workshops that demonstrate ways to solve classroom problems.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 14. I work hard to anticipate classroom problems/barriers to learning.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 15. I tend to anticipate problems when planning new lessons.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 16. I prefer to take action as soon as possible when student results are unsatisfactory.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 17. I often scan educational publications/journals/blogs to solve problems in my classroom.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

4. EO Final Instrument

This instrument measures teachers along dimensions of Innovativeness, Proactiveness, and Risk Taking. Please read each item and choose the response that represents your level of agreement with the item.

* 18. I often commit large amounts of classroom resources to untested teaching practices.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 19. I am willing to gamble on new instructional approaches.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 20. I like to take bold actions by trying unproven teaching methods.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 21. I tend to take chances with my teaching even when the educational outcomes are uncertain.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 22. I like to try versions of classroom practices which are 'long shots' at being successful.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

* 23. I deviate from my school/district's curriculum even when the outcomes are uncertain.

- Very true of me Somewhat true of me Neutral Somewhat untrue of me Very untrue of me

24. OPTIONAL If you wish to identify your school, the researcher will return a entrepreneurial profile of your institution. (Your school will NOT be named in the published dissertation).