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ASSESSING STUDENT ENTREPRENEURIAL CAPACITY: IMPLICATIONS FOR RURAL COMMUNITIES AND HIGHER EDUCATION

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During the 1990s, the U.S. experienced a shift in job creation: large U.S. businesses laid off approximately 10 million workers, while entrepreneurs and small businesses created 20 million jobs during the same decade. Given this shift in job creation, it is clear that entrepreneurship is the new foundation of the U.S. economy. Rural communities, in particular, should be concerned about stimulating entrepreneurship given current challenges, such as declining and aging populations, loss of traditional industry, and declining wages. Entrepreneurial development is vital to the future success and growth of rural economies. The purpose of this study is to report the results of a survey which measured the entrepreneurial capacity of students at a university in rural Kansas. We then draw conclusions about the role universities can play in developing students to become entrepreneurs and creating innovative communities.

INTRODUCTION

Over the past twenty years, an increase in global business activity, changing U.S. demographics, and the emergence of new technology have challenged the traditional business environment. The era of large corporations, controlling capital resources, industrial production, and capital itself has shifted to a new era where successful businesses rely on technology to satisfy customer needs through creativity, innovation and flexibility (MacKenzie, 1992).

Large corporations have responded to these challenges by cutting costs, adopting new technologies, improving efficiency and developing new markets overseas. One of the consequences of cost cutting is the downsizing or elimination of U.S. production facilities. During the 1990s, large U.S. businesses laid off approximately 10 million workers, while entrepreneurs and small businesses created 20 million jobs during the same decade (Ryan, 2004).

Given this shift in job creation, it is clear that entrepreneurship is the new foundation of the U.S. economy. This new industrial era provides unparalleled opportunities for increased entrepreneurial activity because smaller firms have the critical components essential to innovation: nimbleness, agility, and faster new product development (Ryan, 2004). The value of entrepreneurs is evident at both the national and local levels. At the national level, greater entrepreneurial activity leads to stronger GDP growth. At the state level, entrepreneurs create new jobs, increase local incomes and wealth, and connect the community to the larger, global

economy (Henderson, 2002).

The purpose of this study is to report the results of a survey which measured the entrepreneurial capacity of students at a university in rural Kansas and, in turn, draw conclusions about the role universities can play in developing students to become entrepreneurs. Because this geographic area is characterized by a declining population and slow to stagnant economic growth, this potential entrepreneurial development is vital to the future success and growth of this rural economy. In doing so, we first review the literature on entrepreneurship, including its definition, its role in the U.S. and Kansas economy, and defining traits and characteristics. We then describe our methodology, analysis and results. Finally, we conclude with implications for rural communities and institutions of higher education.

Defining Entrepreneurship

“Entrepreneurship is more than the mere creation of business” (Kuratko, 2003: 2). A true entrepreneur seeks opportunities, takes risks, and has the tenacity to push an idea through to reality. Klein (1977: 9) operationally defines an entrepreneur “as a marriage broker between what is desirable from an economic point of view and what is possible from a technological [i.e., operation] point of view.” In other words, an entrepreneur sees an economic opportunity, and through creativity and innovation, creates a product or service to fulfill that need and brings it to the market. “An entrepreneur’s goal is to create or capitalize on new economic opportunities through innovation – by finding new solutions to existing

problems, or by connecting existing solutions to unmet needs or new opportunities” (Lichtenstein and Lyons, 1996: 21).

Entrepreneurship needs community support to succeed. Traditionally, state and local units of government focus attention and incentives on attracting new business or retaining existing businesses (Ryan, 2004). But recent economic, technological, and demographic changes have challenged communities to foster a climate of innovation and creativity.

Entrepreneurship and the Kansas Economy

Kansas has a rich history of entrepreneurship. Key components of the Kansas economy were originally entrepreneurial, home-grown businesses, such as aviation, manufacturing, and telecommunications. Over time, these companies became significant employers, as well as catalysts for creation of a wide array of complementary businesses, including suppliers and distributors.

However, by the 1980s, these once entrepreneurial firms – including Boeing, Coleman, and Sprint – could not, on their own, provide the economic foundation for the state’s economy in the future. Economic, technological, and demographic changes presented new challenges to existing industries, and these changes, if ignored, would result in a continual erosion of the state’s economic base. Ironically, small business entrepreneurship – and business innovation in general – had become a weaknesses for the state’s economy. Specifically, in the mid 1980s, Kansas:

1. Lagged in private and public sector research and development;
2. Lacked a system of technology transfer between state universities and the private sector;
3. Possessed an archaic state tax structure; and,
4. Needed a mechanism to provide financial capital to start-up firms (Redwood and Krider, 1986).

Major changes in state policy, investment, and organization resulted from this crisis. The state’s overall climate for business development improved significantly and economic activity subsequently increased (Redwood, 1992).

Despite the new state economic development strategy developed and revised over the past twenty years, demographic and economic problems still plague rural Kansas, including demographic changes, declining employment in traditional industries, and wage erosion.

Demographic Challenges

U.S. Census estimates show Kansas’ population growth among the nation’s slowest. And most of state’s population growth is centered in urban and suburban areas surrounding Kansas City, Topeka, and Wichita. Communities in rural Kansas face an aging population, tightening labor market, lack of new customers for business, a shrinking tax base, and an overall decline in economic activity.

Decline of Traditional Industries

Rural Kansas, specifically western Kansas, has traditionally relied on agriculture and oil and natural gas production as its primary economic base. And as agriculture becomes less lucrative for smaller farmers, advances in technology allow farmers to efficiently manage larger operations with greater productivity. In the long run, fewer people will be needed in the production of agricultural crops. Oil and natural gas faces similar employment trends. The state’s mining industry may become less significant over time as discovery of new resources does not keep pace with depletion of existing resources.

Eroding Wages

Wage trends over the past two decades indicate that job creation in rural Kansas tends to increasingly focus on low skill, low wage jobs. For example, since 1988, the average wage per job in Ellis County workers has fluctuated around 74 cents for every dollar earned by the average Kansas worker. Similar Kansas counties – including Barton, Finney, Ford and Reno Counties – have higher wages per job, but all have experienced slower wage growth since 1998 than the state as a whole, and the gap between the wages in these counties and the state has expanded (U.S. Bureau of Economic Analysis, 2005).

Role of Communities and Colleges in Entrepreneurship

In order to better understand entrepreneurship in rural areas, we must first answer the following question: What role do communities, particularly those in rural areas, and universities play in fostering creativity and innovation?

Developing Entrepreneurship in Communities

Economically successful communities have found that a balanced economic development strategy focuses on three components: 1) attracting new business, 2) retaining/expanding existing business, and 3) promoting

the development of new, start-up businesses. Economic development strategy that targets start-up businesses is commonly referred to as enterprise development. Lichtenstein, Lyons, and Kutzhanova (2004: 5) argue that in the new economy that “enterprise development is arguably more sustainable, more cost-effective and more attuned to community development than its sister economic development strategies of business attraction and business retention/expansion.”

Entrepreneurial communities possess three critical components:

- **Critical mass of entrepreneurs.** Entrepreneurial communities have a solid base of economically viable entrepreneurial activity that is able to offset any decline from existing businesses in the community (Lichtenstein, Lyons, and Kutzhanova, 2004).
- **Entrepreneurial knowledge and network.** The community has a recognizable number of entrepreneurial individuals who provide a support network of resources, knowledge, and ability to nurture other potential entrepreneurs (Lyons, 2002).
- **Entrepreneurial Spirit.** Innovation is part of the community’s culture. Most community members support the entrepreneurial process by “...making bank loans to start-ups, passing favorable legislation, welcoming new members and including them in social and economic networks, etc.” (Lichtenstein, Lyons, and Kutzhanova, 2004: 7).

Also, an “Entrepreneurial-Friendly” community invests in several specific long-term economic development initiatives:

- **Business Environment.** The tax structure and business regulations must be updated to encourage entrepreneurial activity and mitigate any differences among peer communities (Muske and Woods, 2004; Redwood and Krider, 1986).
- **Financial Capital.** Available business capital with reduced loan criteria, particularly in the areas of seed capital, venture capital, and export finance (Muske and Woods, 2004; Redwood, 1992).
- **Commitment/Capacity Capital.** A network of entrepreneurs provides on-going nurturing and coordination of community entrepreneurs and activities (Lichtenstein and Lyons, 2001).
- **Human Capital.** A system of long-term education that invests in skilled people, encourages immigration of new businesses and people, and inculcates the

concept that innovation and creativity are important to the community as a whole (Florida, 2002).

- **Infrastructure Capital.** Accessible business incubators provide space, support services, and management help to start-up firms at no- or low-cost (Muske and Woods, 2004).

Entrepreneurship in Rural Communities

Investment in innovative business start-ups requires political patience and determination, as results are long term. Unfortunately, taking a long-term approach is not a distinguishing characteristic of American society (Redwood, 1992). Attracting new, established businesses is indeed more politically expedient; for example, the rural community that recruits a new call center may create 50-200 jobs immediately, while a rural incubator may create only 10-30 jobs in a years’ time.

Nevertheless, business recruitment continues to be a popular rural economic development strategy. Over time, attraction of new business has become more difficult, as there are “fewer buffalo to catch,” limited state and local resources, and “industry attracted ‘today’ is gone ‘tomorrow’ unless the long term business fundamentals are sound enough to sustain competitiveness when the subsidies are removed” (Redwood, 1992).

Continued reliance on recruitment creates economic harm for rural communities, as this economic development strategy: 1) siphons economic incentives into the pockets of the developers; 2) creates low wage jobs in low skill service and retail firms; 3) erodes the relative per capita income of the community; 4) increases the community’s reliance on outside forces as fewer firms are locally owned and operated; and 5) shifts the profits of local business to outside areas, eroding local investment and contributions (Emery, Wall, and Macke, 2004).

In contrast, small businesses offer several advantages to rural communities:

- **Job creation.** Entrepreneurial companies create nearly two-thirds of net new jobs (Kauffman, 2002).
- **Innovation.** Small businesses are responsible for 50 percent of all innovations, 67 percent of inventions and 95 percent of all major innovations (Kauffman, 2002).
- **Location.** Entrepreneurial companies make up 5 to 15 percent of all U.S. firms and are dispersed across the country (Kauffman, 2002).
- **Start-Up Potential.** While most entrepreneurial companies start in the home - and with an investment

of less than \$50,000 – these companies represent a variety of industrial sectors (Kauffman, 2002).

- **Further Business Development.** A strong community-based entrepreneurial environment in rural areas may lead to creation of new businesses or relocation of related businesses (Emery, Wall, and Macke, 2004).
- **Wage Growth.** In 2001, the average self-employed rural worker – or small business owner – reported approximately \$33,000 in annual personal income. In contrast, rural private workers and government employees earned \$27,000 and \$30,000, respectively (Henderson, 2002).

Entrepreneurship on College Campuses

While earlier research indicated that universities impeded entrepreneurship on campus, recent case studies suggest that universities, particularly those in rural areas, may have adopted more innovative approaches to enterprise development.

Jefferson (1989) noted that universities supported entrepreneurship in theory, through course offerings and student organizations, but that school administrators tended to support barriers to innovation on campus. Specifically, universities tended to control entrepreneurial activity by: 1) prohibiting student businesses without university supervision; 2) controlling the types of products that students could sell on campus; and, 3) preventing the creation of student businesses that competed with one another or with university operations (Jefferson, 1989).

However, possibly given the economic, demographic and technologic changes noted earlier, some universities, particularly in rural areas, have begun to develop creative programs to foster entrepreneurship. A case study of a program by University of Vermont suggests that a university-community alliances promoted entrepreneurial activity in rural communities. Through a unique approach, University of Vermont program encouraged faculty participation in community entrepreneurial activities and provided a small source of financial capital as well (Sonnerup, Savitt, and Sullivan, 1997). While this particular program is not definitive, it does propose that universities serve as laboratories of innovation by pairing the unique strengths of each educational institution to the opportunities in their communities.

Traits and Characteristics of Entrepreneurs

As Gartner (1989: 29) points out, “Entrepreneurship researchers studying traits and characteristics seek to

answer the question, ‘Why are some individuals entrepreneurial, while others are not?’ The basic assumption of trait and characteristic research is that internal dispositions have an influence on behavior.”

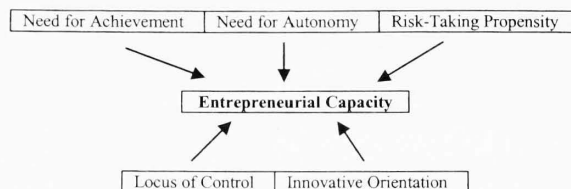
Kamineni (2002: 89) noted that the use of psychological attributes “has found a prominent place in the entrepreneurship literature and hence cannot be ignored.” Much of this research has focused on need for achievement, risk-taking propensity, and locus of control (Kamineni 2002), and Brockhaus (1982) and Brockhaus and Horwitz (1986) provide comprehensive reviews of this literature.

Sexton and Bowman (1983: 215) discuss the importance of identifying a profile of psychological characteristics of entrepreneurs:

- A testing instrument could be devised to identify those individuals possessing personality characteristics of entrepreneurs. The test could also reveal the lack of certain traits among individuals who desire an entrepreneurial vocation. Behavior modification techniques could be employed to augment areas of deficiencies.
- A better understanding of the entrepreneurial personality would be of use in the area of entrepreneurship education. Entrepreneurial potential, if recognized, can be nurtured through instructional intervention.
- An understanding of the psychological profile of the entrepreneur can be of great benefit in business organizations... Businesses must understand entrepreneurial traits in order to create the necessary organizational climate which will be conducive to internal entrepreneurship.
- Business schools must understand the entrepreneur if they expect to develop a curriculum beneficial to the potential entrepreneur.”

Entrepreneurial Capacity

Previous research has shown that entrepreneurs have a certain “entrepreneurial capacity” or set of measurable psychological characteristics that differentiates them from non-entrepreneurs. Based on the research of Johnson, Newby, and Watson (2003; 2005), we define “entrepreneurial capacity” as the potential or suitability for holding, storing, or accommodating the following psychological characteristics: need for achievement, need for autonomy, risk-taking propensity, locus of control, and innovative orientation. This is depicted in figure 1.

Figure 1: Conceptualization of Entrepreneurial Capacity

While Johnson, Newby, and Watson (2003; 2005) include other characteristics in their studies, we have limited our conceptual and operational definitions of entrepreneurial capacity to include those characteristics that are relevant to our population of interest: students at a university in rural Kansas. For example, Johnson, Newby, and Watson (2005) studied SME owner-operators and included four dimensions contained within Carland et al.'s (1984) definition of the entrepreneur: establishment status (founder/non-founder), owner-operator goals, innovative orientation, and strategic practice. Three of the four characteristics (establishment status, owner-operator goals, and strategic practice) are only relevant to current business owners. For example, Johnson, Newby, and Watson's (2005) measurement of strategic practice is the question, "How quickly does your business introduce new products/services?" Because university students are not typically business owners, these characteristics were not included in our conceptual and operational definitions of entrepreneurial capacity.

Johnson, Newby, and Watson (2005) provide a rather comprehensive review of the literature assessing the characteristics consistent with our definition of entrepreneurial capacity. Here we focus on the definitions of the characteristics, rather than a review of the extensive literature on each.

Need for Achievement

The need for achievement refers to the fact that entrepreneurs are self-starters. To others they appear to be internally driven by a strong desire to compete, to excel against self-imposed standards, and to pursue and attain challenging goals (Kuratko and Hodgetts 2004). Much research has supported the view that need for achievement and entrepreneurship are positively correlated (see Johnson, Newby, and Watson, 2005).

Need for Autonomy

As with need for achievement, need for autonomy has often been assumed to be related to entrepreneurial motivation. It is defined as the desire to be independent

and self-directing (Harrell and Alpert, 1979; McClelland 1975). Need for autonomy has been offered as an underlying motive as why most entrepreneurs are not a "good fit" with the typically-structured organization that is often characterized by a restrictive environment of rules, policies and procedures.

Risk-Taking Propensity

Risk-taking propensity has been defined as "the perceived probability of receiving the rewards associated with success of a proposed situation, which is required by an individual before he will subject himself to the consequences associated with failure, the alternative situation providing less reward as well as less severe consequences than the proposed situation" (Brockhaus 1980: 513). While this characteristic has been studied quite a bit in an attempt to distinguish entrepreneurs from others (e.g., small business owners, managers), Brockhaus (1980) found that risk-taking propensity may not be a distinguishing characteristic of entrepreneurs, representing a "major deviation from the widely reported theory that entrepreneurs are the more moderate risk takers" (Brockhaus, 1980: 518-519). Similarly, other authors have questioned the use of risk-taking propensity as a distinguishing characteristic of entrepreneurs due to conflicting empirical results in the literature (Carland, Carland and Stewart, 1999). Carland, Carland and Stewart (1999) provide a summary of relatively recent empirical research on risk-taking propensity.

Locus of Control

Locus of control "refers to the ability an individual believes they have to influence events in their lives. 'Internals' believe they have influence over outcomes through their own abilities, efforts, or skills, while 'Externals' believe the forces outside their control determine outcomes" (Rotter 1966). While Rotter (1966) originally conceived locus of control as a one-dimensional scale, Levenson (1981) proposed a multi-dimensional construct consisting of "internal," "powerful others," and "chance" components of locus of control

(with powerful others locus of control and chance locus of control as *external* locus of control measures). As Johnson, Newby, and Watson (2005) point out, most research suggests a negative correlation between powerful others locus of control and entrepreneurship, as well as chance locus of control and entrepreneurship, due to the belief that entrepreneurship is inversely related to externality. On the other hand, entrepreneurship is generally found to be positively correlated with internal locus of control (Johnson, Newby, and Watson, 2005).

Innovative Orientation

The final characteristic, innovative orientation, is a primary component of Carland et al.'s (1984: 358) definition of entrepreneurship: "An entrepreneur is an individual who establishes and manages a business for the principle purposes of profit and growth. The entrepreneur is characterized principally by innovative behavior and will employ strategic management practices in the business." In fact, Schumpeter (1934) believed that innovation was the central characteristic of the entrepreneurial endeavor. As Carland et al. (1984: 357) contend, "The critical factor proposed here to distinguish entrepreneurs from nonentrepreneurial managers and, in particular, small business owners, is innovation. The entrepreneur is characterized by a preference for creating activity, manifested by some innovative combination of resources for profit."

Hypotheses

Given our definition of entrepreneurial capacity, our purposes are to identify potential or "budding" entrepreneurs and to establish whether student entrepreneurial capacity exists so that, in turn, we can draw conclusions about the role universities can play in developing students to become entrepreneurs. In doing so, we have developed a set of hypotheses concerning differences in students' levels of entrepreneurial capacity with respect to educational (major), demographic (gender, family status), and behavioral (personal goals) characteristics.

Regarding educational characteristics, Sexton and Bowman (1983) conducted a comparative analysis of entrepreneurship majors (which is typically part of a business program) and other students on a university campus to identify differences in psychological characteristics, risk-taking propensity and work values among the two groups. Significant differences were found between "budding entrepreneurs" (entrepreneurship majors) and other students on 11 of 35

personality scales and on three work values. For example, entrepreneurship students scored significantly higher than others on autonomy, innovation, and risk-taking; however, they scored significantly lower than others on anxiety, cognitive structure, and conformity.

Demographic variables have been studied as well in an attempt to distinguish entrepreneurs from others such as small business owners or managers (Vaught and Hoy, 1981), but this work "has been largely atheoretical" (Vecchio, 2003: 310). However, as Naffziger, Hornsby and Kuratko (1994) point out, an individual's personal environment (which includes demographic variables such as gender and family status) may influence one's decision to act entrepreneurially. Regarding gender, Fairlie and Meyer (1996) found that female rates of self-employment (in an aggregate across several ethnic and racial groupings) were 55 percent of the rate of male self-employment. Regarding family status, Greenberger and Sexton (1988) propose that even when the idea exists and people have the "personality of an entrepreneur," they may need push from others to convince themselves to implement the idea (i.e., "social support"). For example, Cooper and Dunkelberg (1987) found that 50 percent of entrepreneurs had at least one parent or guardian who was self-employed, and other research has found that social and entrepreneurial networks that provide access to support and expertise (which may include family members) are important (see Naffziger, Hornsby and Kuratko, 1994).

A behavioral characteristic of interest here is the personal goals of an entrepreneur, which derive from one's desire to start his/her own business and may vary by individual. For example, entrepreneurs may desire to start a business to rapidly grow a firm, cash out, retire, or to be his/her own boss (Naffziger, Hornsby and Kuratko, 1994). Regardless of the specific goal, an entrepreneur must first have that desire to start his/her own business.

Therefore, we propose the following:

H1: Male business students demonstrate a significantly higher level of entrepreneurial capacity than male non-business students and female students. More specifically, they exhibit higher levels of need for achievement, need for autonomy, risk-taking propensity, locus of control, and innovative orientation.

H2: Those students who have a family history of entrepreneurship demonstrate a significantly higher level of entrepreneurial capacity than those students who do not have a family history of

entrepreneurship. More specifically, they exhibit higher levels of need for achievement, need for autonomy, risk-taking propensity, locus of control, and innovative orientation.

H3: Those students who have a desire to start their own business demonstrate a significantly higher level of entrepreneurial capacity than those students who have no desire to start their own business. More specifically, they exhibit higher levels of need for achievement, need for autonomy, risk-taking propensity, locus of control, and innovative orientation.

METHODOLOGY

Sample Selection

A random sample of 20 business-related courses and 30 non-business-related courses were drawn from the

entire selection of on-campus available courses for the Spring 2005 semester. As a result, a total of 668 total students were surveyed, accounting for slightly over 15% of the total on-campus enrollment which was reported at 4,344 students on the 20th day of class. When referring to major, all business students were combined to form a group that was compared against all other non-business majors, which resulted in 241 business students and 427 non-business students surveyed.

The majority of students (55.9%) were from towns with less than 5,000 in population. In addition, most students (66.2%) indicated that they were considering starting a business, with business majors (74.3%) indicating a greater interest than non-business majors (61.6%). Nearly two-thirds of the students surveyed (63.6%) have a family member with entrepreneurship history. A summary of participant characteristics is presented in table 1.

Table 1: Participant Characteristics

Characteristic	Number of Participants
Major (total n = 668)	
Business	27
Accounting	54
Business Communications	13
Business Education	10
Computer Information Systems	10
Information Systems Administration	16
Office Technology	14
Finance	47
Organizational Leadership	14
Management	66
Marketing	53
MBA	2
Non-Business	241
Undecided	20
Age (total n = 668)	
18	30
19	141
20	171
21	128
22	74
23	41
>24	78
Missing	5
Gender (total n = 668)	
Male	321
Female	340
Missing	7
Classification (total n = 668)	
Freshman	121
Sophomore	183
Junior	200
Senior	149
Graduate	8
Missing	7

Measurement of Variables

Need for Achievement: The Steers and Braunstein's (1976) Manifest Needs Questionnaire was used in order to determine the need for achievement variable which consisted of five items. These variables were measured using a standard seven-point Likert scale ranging from '1' (strongly disagree) to '7' (strongly agree). This allowed for the value of the variable to range from 5 to 35 ($\alpha = .45$; $n = 666$).

Need for Autonomy: The relevant items from the commonly used Steers and Braunstein's (1976) Manifest Needs Questionnaire were used to assess the need for autonomy. This sub-scale consisted of five items that were measured by a standard seven-point Likert scale ranging from '1' (strongly disagree) to '7' (strongly agree). This allowed for the value of the variable to range from 5 to 35 ($\alpha = .46$; $n = 667$).

Risk-Taking Propensity: The Jackson Personality Inventory (Jackson 1976) also included a sub-scale for measuring risk. The scale, consisting of six items, was used to measure the risk-taking propensity of the subjects. The variables were measured using a standard seven-point Likert scale ranging from '1' (strongly disagree) to '7' (strongly agree). This allowed for the value of the variable to range from 6 to 42 ($\alpha = .52$, $n = 667$).

Locus of Control: To efficiently assess locus of control, Lumpkin's (1988) abbreviated version of Levenson's (1981) Locus of Control Scale was used. This shortened version contains a total of nine variables which can be sub-divided into three items from each of the internal, powerful others, and chance sub-scales. Remaining consistent with the other measures, a standard seven-point Likert scale ranging from '1' (strongly disagree) to '7' (strongly agree) was used. This allowed for the value of the variable to range from 9 to 63. Each dimension, therefore, could range from 3 to 21 (internal: $\alpha = .38$, $n = 667$; powerful others: $\alpha = .30$, $n = 666$; chance: $\alpha = .50$, $n = 665$).

Innovative Orientation: The Innovativeness sub-scale of the Jackson Personality Inventory (Jackson 1976) was used to measure the preference for innovation. The data collection encompassed seven items which were measured by a standard seven-point Likert scale ranging from '1' (strongly disagree) to '7' (strongly agree). This allowed for a possible variable value range from 7 to 49 ($\alpha = .75$; $n = 665$).

Family History of Entrepreneurship: We asked students about their social support in behaving entrepreneurially by asking, "Has anyone in your

immediate family ever been involved in starting their own business?" (with a possible response of yes or no).

Desire to Start a Business: Students were asked, "Have you ever considered starting your own business?" (with a possible response of yes or no).

Analyses and Results

To test hypothesis 1, an analysis of variance was conducted with gender and major as independent variables for each dependent variable (need for achievement, need for autonomy, risk-taking propensity, locus of control, and innovative orientation). In all analyses, the interaction between gender and major was not significant. Some of the main effects, however, were significant, as detailed below. When a significant main effect was found, the analysis proceeded with an independent samples *t* test for that particular independent variable.

To test hypotheses 2 and 3, independent-samples *t* tests were conducted for each of the five dependent variables comparing the mean scores of those who have a history of family entrepreneurs to those with no history of family entrepreneurs, as well as comparing students who have a desire to start their own business with those who have no desire to start their own business.

Need for Achievement

In testing hypothesis 1, the main effect for gender was not significant ($F(1,655) = .18$, $p > .05$). The main effect for major was significant ($F(1,655) = 16.54$, $p < .05$). Finally, the interaction between gender and major was not significant ($F(1,655) = .20$, $p > .05$). Thus, major has a significant effect on need for achievement. An independent-samples *t* test comparing the mean scores of the business students and non-business students found a significant difference between the means of the two groups ($t(664) = -3.62$, $p < .05$). The mean of the business students is higher ($m = 26.70$, $sd = 3.24$) than the mean of the non-business students ($m = 25.77$, $sd = 3.13$).

In testing hypotheses 2 and 3, in the *t* test comparing the mean scores of those who have a history of family entrepreneurs to those with no history of family entrepreneurs, a significant difference was found between the means of the two groups ($t(664) = -4.29$, $p < .05$). The mean of the group that has entrepreneurs in their immediate family is higher ($m = 26.51$, $sd = 3.12$) than the mean of the group with no family entrepreneurs ($m = 25.42$, $sd = 3.23$). In the *t* test comparing the mean scores of students who have a desire to start their own business with those who have no desire to start their own business,

a significant difference was found between the means of the two groups ($t(664) = -3.13, p < .05$). The mean of the group that has considered starting their own business is higher ($m = 26.39, sd = 3.24$) than the mean of the group that has not considered starting their own business ($m = 25.57, sd = 3.05$).

Need for Autonomy

In testing hypothesis 1, the main effect for gender was significant ($F(1,656) = 45.13, p < .05$). The main effect for major was not significant ($F(1,656) = 2.03, p > .05$). Finally, the interaction between gender and major was not significant ($F(1,656) = 3.47, p > .05$). Thus, gender has a significant effect on need for autonomy. An independent-samples t test comparing the mean scores of the male group and female group found a significant difference between the means of the two groups ($t(658) = -6.34, p < .05$). The mean of the male group is significantly higher ($m = 15.14, sd = 2.99$) than the mean of the female group ($m = 13.64, sd = 3.06$).

In testing hypotheses 2 and 3, in the t test comparing the mean scores of those who have a history of family entrepreneurs to those with no history of family entrepreneurs, no significant difference was found between the means of the two groups ($t(665) = -1.30, p > .05$). In the t test comparing the mean scores of students who have a desire to start their own business with those who have no desire to start their own business, a significant difference was found between the means of the two groups ($t(665) = -4.31, p < .05$). The mean of the group that has considered starting their own business is higher ($m = 14.74, sd = 3.13$) than the mean of the group that has not considered starting their own business ($m = 13.65, sd = 2.96$).

Risk-Taking Propensity

In testing hypothesis 1, the main effect for gender was significant ($F(1,656) = 77.52, p < .05$). The main effect for major was not significant ($F(1,656) = 1.28, p > .05$). Finally, the interaction between gender and major was not significant ($F(1,656) = .27, p > .05$). Thus, gender has a significant effect on risk-taking propensity. An independent-samples t test comparing the mean scores of the male group and female group found a significant difference between the means of the two groups ($t(658) = -9.47, p < .05$). The mean of the male group is significantly higher ($m = 26.25, sd = 4.23$) than the mean of the female group ($m = 23.10, sd = 4.33$).

In testing hypotheses 2 and 3, in the t test comparing the mean scores of those who have a history of family

entrepreneurs to those with no history of family entrepreneurs, a significant difference was found between the means of the two groups ($t(665) = -3.41, p < .05$). The mean of the group that has entrepreneurs in their immediate family is higher ($m = 25.06, sd = 4.35$) than the mean of the group with no family entrepreneurs ($m = 23.83, sd = 4.78$). In the t test comparing the mean scores of students who have a desire to start their own business with those who have no desire to start their own business, a significant difference was found between the means of the two groups ($t(665) = -8.15, p < .05$). The mean of the group that has considered starting their own business is higher ($m = 25.59, sd = 4.45$) than the mean of the group that has not considered starting their own business ($m = 22.70, sd = 4.13$).

Locus of Control

Internal Locus of Control. In testing hypothesis 1, the main effect for gender was not significant ($F(1,656) = 1.826, p > .05$). The main effect for major was not significant ($F(1,656) = 1.385, p > .05$). Finally, the interaction between gender and major was not significant ($F(1,656) = 2.404, p > .05$). Thus, neither gender nor major has a significant effect on internal locus of control.

In testing hypotheses 2 and 3, in the t test comparing the mean scores of those who have a history of family entrepreneurs to those with no history of family entrepreneurs, a significant difference was found between the means of the two groups ($t(665) = -2.28, p < .05$). The mean of the group that has entrepreneurs in their immediate family is higher ($m = 17.17, sd = 2.08$) than the mean of the group with no family entrepreneurs ($m = 16.67, sd = 2.20$). In the t test comparing the mean scores of students who have a desire to start their own business with those who have no desire to start their own business, a significant difference was found between the means of the two groups ($t(665) = -2.53, p < .05$). The mean of the group that has considered starting their own business is higher ($m = 17.17, sd = 2.07$) than the mean of the group that has not considered starting their own business ($m = 16.73, sd = 2.23$).

Locus of Control - Powerful Others. In testing hypothesis 1, the main effect for gender was not significant ($F(1,655) = .240, p > .05$). The main effect for major was not significant ($F(1,655) = .309, p > .05$). Finally, the interaction between gender and major was not significant ($F(1,655) = .049, p > .05$). Thus, neither gender nor major has a significant effect on locus of control – powerful others.

In testing hypotheses 2 and 3, in the t test comparing

the mean scores of those who have a history of family entrepreneurs to those with no history of family entrepreneurs, no significant difference was found between the means of the two groups ($t(664) = 1.54, p > .05$). In the t test comparing the mean scores of students who have a desire to start their own business with those who have no desire to start their own business, no significant difference was found between the means of the two groups ($t(664) = 1.43, p > .05$).

Locus of Control – Chance. In testing hypothesis 1, the main effect for gender was not significant ($F(1,654) = 2.659, p > .05$). The main effect for major was not significant ($F(1,654) = 1.725, p > .05$). Finally, the interaction between gender and major was not significant ($F(1,654) = .164, p > .05$). Thus, neither gender nor major has a significant effect on locus of control – chance.

In testing hypotheses 2 and 3, in the t test comparing the mean scores of those who have a history of family entrepreneurs to those with no history of family entrepreneurs, no significant difference was found between the means of the two groups ($t(663) = 1.85, p > .05$). In the t test comparing the mean scores of students who have a desire to start their own business with those who have no desire to start their own business, a significant difference was found between the means of the two groups ($t(663) = 2.80, p < .05$). The mean of the group that has considered starting their own business is lower ($m = 10.84, sd = 2.95$) than the mean of the group

that has not considered starting their own business ($m = 11.50, sd = 2.68$).

Innovative Orientation

In testing hypothesis 1, the main effect for gender was not significant ($F(1,654) = 2.354, p > .05$). The main effect for major was not significant ($F(1,654) = 1.301, p > .05$). Finally, the interaction between gender and major was not significant ($F(1,654) = .300, p > .05$). Thus, neither gender nor major has a significant effect on innovativeness.

In testing hypotheses 2 and 3, in the t test comparing the mean scores of those who have a history of family entrepreneurs to those with no history of family entrepreneurs, a significant difference was found between the means of the two groups ($t(663) = -2.00, p < .05$). The mean of the group that has entrepreneurs in their immediate family is higher ($m = 32.71, sd = 5.75$) than the mean of the group with no family entrepreneurs ($m = 31.75, sd = 6.20$). In the t test comparing the mean scores of students who have a desire to start their own business with those who have no desire to start their own business, a significant difference was found between the means of the two groups ($t(663) = -5.03, p < .05$). The mean of the group that has considered starting their own business is higher ($m = 33.18, sd = 5.72$) than the mean of the group that has not considered starting their own business ($m = 30.77, sd = 6.03$).

Table 2: Hypothesis 1 Results

Characteristic	Analysis	Conclusion
Need for Achievement		
Gender X Major	Not significant	
Gender	Not significant	
Major	$F(1,655) = 16.54, p < .05$	Business students > non-business students
Need for Autonomy		
Gender X Major	Not significant	
Gender	$F(1,656) = 45.13, p < .05$	
Major	Not significant	Males > females
Risk-Taking Propensity		
Gender X Major	Not significant	
Gender	$F(1,656) = 77.52, p < .05$	Males > females
Major	Not significant	
Internal Locus of Control		
Gender X Major	Not significant	
Gender	Not significant	
Major	Not significant	
Locus of Control – Powerful Others		
Gender X Major	Not significant	
Gender	Not significant	
Major	Not significant	
Locus of Control – Chance		
Gender X Major	Not significant	
Gender	Not significant	
Major	Not significant	
Innovative Orientation		
Gender X Major	Not significant	
Gender	Not significant	
Major	Not significant	

Summary of Analyses

For hypothesis 1, the interaction of gender and major was not supported. However, meaningful main effects for gender or major were found. Specifically, business students scored higher than non-business students on need for achievement. Males scored higher than females

on need for autonomy and risk-taking propensity. These results are shown in table 2 above.

For hypothesis 2, some support was found. Those with a history of family entrepreneurs scored higher than those without a history of family entrepreneurs on need for achievement, risk-taking propensity, internal locus of control, and innovative orientation. Results are in table 3.

Table 3: Hypothesis 2 Results

Characteristic	Analysis	Conclusion
Need for Achievement	t(664) = -4.29, p<.05	Family history of entrepreneurs > no history
Need for Autonomy	Not significant	
Risk-Taking Propensity	t(665) = -3.41, p<.05	Family history of entrepreneurs > no history
Internal Locus of Control	t(665) = -2.28, p<.05	Family history of entrepreneurs > no history
Locus of Control – Powerful Others	Not significant	
Locus of Control – Chance	Not significant	
Innovative Orientation	t(663) = -2.00, p<.05	Family history of entrepreneurs > no history

For hypothesis 3, some support was found as well. Those who have a desire to start their own business scored higher than those who have no desire to start their own business on need for

achievement, need for autonomy, risk-taking propensity, and internal locus of control. In addition, they scored lower on locus of control – chance. These results are shown in table 4.

Table 4: Hypothesis 3 Results

Characteristic	Analysis	Conclusion
Need for Achievement	t(664) = -3.13, p<.05	Desire to start business > No desire
Need for Autonomy	t(665) = -4.31, p<.05	Desire to start business > No desire
Risk-Taking Propensity	t(665) = -8.15, p<.05	Desire to start business > No desire
Internal Locus of Control	t(665) = -2.53, p<.05	Desire to start business > No desire
Locus of Control – Powerful Others	Not significant	
Locus of Control – Chance	t(663) = 2.80, p<.05	Desire to start business < No desire
Innovative Orientation	t(663) = -5.03, p<.05	Desire to start business > No desire

CONCLUSION

Given the partial support for our hypotheses and the fact that most students indicated that they were considering starting a business (66.2%, with business majors indicating a greater interest than non-business majors) and that they have a family member with entrepreneurship history (63.6%), we conclude that these university students have the desire, family background, and psychological characteristics that support creative business activity and risk taking (i.e., entrepreneurial capacity). These results suggest potential opportunities on which universities can capitalize in developing students to become entrepreneurs and creating innovative communities. Because rural Kansas is characterized by a declining population and slow to stagnant economic growth, this potential entrepreneurial development is vital to its future success and growth.

As Lichtenstein, Lyons, and Kutshanova (2004) and Lyons (2002) propose, entrepreneurial communities possess three critical components: a critical mass of entrepreneurs, entrepreneurial knowledge and network,

and entrepreneurial spirit. Certainly universities can assist in developing these components by:

- Moving beyond traditional coursework to create an innovative culture on campuses and in communities;
- Creating mentorship programs for on-campus and community entrepreneurs by encouraging faculty participation in community entrepreneurial activities;
- Developing community outreach programs in order to inculcate the value of innovation, creativity and adapting to change;
- Providing financial capital to assist in the development of business plans and to offer nominal seed capital;
- Work with state legislatures and political organizations to develop adequate, on-going sources of seed and venture capital and export finance, particularly within rural communities; and,
- Developing a degree program in entrepreneurship and/or requiring all business majors to take courses that emphasize innovation, creativity and adapting to

change to leverage and further develop students' entrepreneurial capacity.

For example, Vesper (1990) found that universities may positively influence students' entrepreneurial behavior by creating an awareness of entrepreneurship. More importantly, research indicates that development of entrepreneurial traits may be achieved through classroom activities, including encouraging specific traits, the use of behavior simulations, and other skill building components. Key behavior traits, such as self confidence, self esteem, self efficacy, negotiation, leadership, and creative thinking, may be successfully transferred through education. Research supports the idea that psychological attributes associated with entrepreneurship can be culturally and experientially acquired (Vesper, 1990; Gorman, 1997; Rasheed, 2001). For example, Rasheed (2001) found that pre-collegiate level students who received entrepreneurial training (in the form of a year-long training class) developed higher needs for achievement, senses of personal control (i.e., internal locus of control), and higher levels of innovation (when a new venture creation was incorporated as part of the classroom activities). Furthermore, entrepreneurship educators can enhance the development of entrepreneurial traits by displaying or incorporating innovation and risk-taking propensity themselves.

Future research should continue measuring student entrepreneurial capacity to track any changes from the benchmarks established here, particularly as campus and community programs are developed and implemented as suggested above. This could be examined in conjunction with institutional advancement data assessing the entrepreneurially activity of alumni over the last few decades. In addition, researchers should investigate other approaches that universities may utilize to foster entrepreneurial behavior, and identify and emulate new, creative and successful programs developed by universities, communities and the private sector. These programs should be tailored to take into consideration the entrepreneurial capacity of the specific population.

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