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## Gender and Entrepreneurial Traits using the Entrepreneurial Mindset Profile (EMP) Assessment

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Gender and Entrepreneurial Traits using the Entrepreneurial Mindset Profile (EMP) Assessment

An Honors Thesis Submitted to  
the Haslam College of Business  
in partial fulfillment of the Honors requirements

UNIVERSITY OF TENNESSEE

Smith Global Leadership Scholars

by

Browning Clark

April 2023

Faculty Advisor: Professor Melissa Cardon



**THESIS/CAPSTONE ADVISOR SIGNATURE APPROVAL PAGE**

University of Tennessee  
Haslam College of Business  
Smith Global Leadership Scholars

This is to certify that the thesis/capstone project prepared by Browning Clark titled "Gender and Entrepreneurial Traits using the Entrepreneurial Mindset Profile (EMP) Assessment" completed in fulfillment of the requirements for the Smith Global Leadership Scholars program meets the accepted standards.

As the faculty advisor for: Browning Clark  
Student Name

I have read this paper and find it  
satisfactory.

A handwritten signature in black ink that reads 'Melissa S. Cardon'.

\_\_\_\_\_  
GLS Thesis Advisor Faculty Signature

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March 8, 2023

Date

### **Abstract**

This thesis explores the relationship between gender and entrepreneurship at the undergraduate level at the University of Tennessee-Knoxville. The study aims to identify the impact of gender on entrepreneurial skills and the development of these skills over the course of the semester. The research is quantitative and based on the Entrepreneurial Mindset Profile (EMP) Assessment; undergraduate students in Entrepreneurship 350 took the assessment at the beginning and end of the Fall 2022 semester. The study seeks to uncover gender-based differences in entrepreneurial traits and skills and the effects of entrepreneurship education on these traits and skills. The findings suggest that for some traits or skills, gender does play a significant role— at both the beginning of the semester, and in terms of changes to those factors between the beginning and end of the semester. The study concludes with recommendations for the University of Tennessee-Knoxville’s undergraduate course instructors concerning how they might better address gender differences.

*Keywords:* Gender and Entrepreneurship, Entrepreneurship Education, Entrepreneurial Mindset Profile Assessment, University of Tennessee-Knoxville

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## Introduction

Entrepreneurship has become an increasingly popular topic in higher education because of its importance to the national and global economy. Thus, entrepreneurship education is growing rapidly—particularly at the undergraduate level. These classes aim to provide students with the knowledge, skills, and experiences necessary to pursue their own entrepreneurial endeavors during and after college. However, despite the growth of these programs, the gender gap in entrepreneurship persists with women entrepreneurs massively underrepresented in the business world (Ward et al., 2019). The purpose of this thesis is to investigate the relationship between gender and entrepreneurship at the undergraduate level at the University of Tennessee-Knoxville.

This thesis utilizes quantitative research methods to examine the impact of gender on 14 different personality traits and skills measured by the Entrepreneurial Mindset Profile Assessment. Specifically, in this research, I aim to identify gender differences in the ‘intrinsic traits’ at the beginning of the semester and understand how entrepreneurial education impacts these dimensions based on students’ gender over the course of the semester. The study seeks to answer the following research questions:

1. Are there entrepreneurial skills or traits that women are more likely than men to possess?
2. Are there entrepreneurial skills or traits that women are more likely than men to see growth in over the course of the semester?
3. How does entrepreneurial education ‘move the needle’ for women (on which particular traits or skills)?

By identifying how gender affects entrepreneurial traits and skills, the study will provide information and recommendations for how to develop curriculum that is more inclusive and developmental for women at the University of Tennessee-Knoxville.

### **Review of Literature**

Entrepreneurship is no easy task. It requires an individual to pursue a venture that has never been pursued before. Entrepreneurs must fight issues of self-doubt, unrealistic expectations, and extreme amounts of work. However, entrepreneurship is critical to growth of the global economy. In fact, entrepreneurship is directly related to and spurs economic expansion (Urbano et al., 2019). William Baumol and Robert Stromp argue that the “unparalleled levels of [economic] growth” can only be attributed to entrepreneurs (Baumol & Strom, 2007). As a result, higher education is placing more emphasis on entrepreneurial curriculum and education. Universities across the globe are offering entrepreneurship learning across many different majors, minors, and classes.

A group of European researchers conducted a study that found evidence that entrepreneurship education positively influences the attitudes and intentions of students and could lead to greater pursuit of entrepreneurial endeavors (Boldureanu et al., 2020). Additionally, the education provides students with skills and a better understanding of their strengths to achieve more entrepreneurial success. Research has also found that early exposure to entrepreneurial role models increases students’ confidence and attitudes towards entrepreneurship. Thus, universities have an opportunity to create entrepreneurial curriculum to help promote entrepreneurship.

At the University of Tennessee, the Haslam College of Business has a Management & Entrepreneurship department. There are programs offered at the undergraduate, graduate, and doctorate level. Additionally, an entrepreneurship minor is offered to students from all academic programs of study. There is also a minor offered in social entrepreneurship. Thus, the college currently has extensive curriculum that would allow any student to pursue entrepreneurial education. In research for my thesis, I will focus on data gathered in the Entrepreneurship 350 class: “Introduction to Entrepreneurship.”



Entrepreneurs are believed to possess certain skills or traits. Whether these traits are born (inherent) or learned, there is a multitude of research on entrepreneurial characteristics. Additionally, there is research on the intersection of entrepreneurial potential and gender. There are significantly fewer female entrepreneurs than male. Some research suggests this is due to differences in personality traits between genders, such as propensity towards risk (Ward et al., 2019). I will explore current research on the effects of gender on entrepreneurial traits and skills.

This literature review will examine the role of gender on entrepreneurial traits and skills, entrepreneurial education, and the Entrepreneurial Mindset Profile, which will be used to assess student entrepreneurs at the University of Tennessee-Knoxville. The Entrepreneurial Mindset Profile is currently being used in the Entrepreneurship 350 course described above.

### **Entrepreneurial Traits and Skills**

With a globally growing focus on entrepreneurship, researchers are working to understand the personalities and behaviors behind successful entrepreneurs. While this research has been around for decades, research on personality traits has intensified during the last two decades (Brandstatter, 2011) Brandstatter argues that a person's characteristics are critical when predicting entrepreneurial performance and entrepreneurial intention. While research on personality traits first arose in the 1970s and the 1980s, it gained significant momentum in the 1990s; Brandstatter contends this is largely a result of the acceptance of the five-factor model of personality (i.e, openness to experience, conscientiousness, extroversion, agreeableness, neuroticism; Barrick & Mount, 1991) which can be used to generalize the results of studies. Through his research, and using a five-factor model, Brandstatter argues that personality traits have a stronger influence on a career in entrepreneurship than most other professions. Entrepreneurs have more freedom in

choosing their environment and are able to act in accordance with personal goals; thus, it is critical to help aspiring entrepreneurs understand cognitive abilities, motives, values, and temperaments of psychological entrepreneurship research (Brandstatter, 2011).

Additionally, Danny Miller has added significant research to understanding the psychology of entrepreneurship. His research explores the Janus-faced nature of personalities typically associated with entrepreneurs; he observed that positive personality traits, like energy, passion, and need for achievement, can be incredibly valuable to entrepreneurs; however, he also argues that the negative extremes of these personality traits may have detrimental outcomes. Miller contends that organizations tend to overlook the “dark side” of entrepreneurship, and this is an area for future research (Miller, 2015). Anthony Klotz and Donald Neubaum evaluated the research of Miller and provide recommendations with a focus on organizational behavior. Klotz and Neubaum argue that defining entrepreneur’s traits as Janus-faced (as Miller did) is problematic and limiting. Instead, they suggest conceptualizing these traits in a more multifaceted way, which is more representative of individuals. They explain that “entrepreneurs have multifaceted personalities, with positive traits potentially have a dark side, and dark traits potentially having a bright side” (Klotz & Neubaum, p. 8 2016). Klotz and Neubaum urge researchers to be careful with the use of personality traits and labels in research related to entrepreneurship (Klotz & Neubaum, 2016).

Research has even found links between mental illness or mental states and entrepreneurship; in fact, research has found overlap between bipolar disorder and entrepreneurship. Sheri Johnson, James Madole, and Michael Freeman evaluate the overlapping personality traits between mania risk and entrepreneurship in their research. Their research found support for the idea that certain personality traits related to mania risk may be tied to the propensity

to become an entrepreneur; only a subset of the traits related uniquely to entrepreneurship, however. Their research provides significant opportunity for those with bipolar disorder. In the current work force, individuals with mental illness are often described only negative; however, these stigmas may lead to missed opportunities for innovation and development within an organization (Johnson et al., 2018).

While significant research has been done that explores different personality traits, characteristics, and skills, it is important for researchers to utilize this previous research in a way that is not limiting to future entrepreneurs or future researchers. In my research, I will consciously work to ensure I do not define individuals by the results of their EMP assessment.

### **Gender and Entrepreneurial Traits**

Research on entrepreneurial traits can be limiting, as argued by Klotz and Neubaum; this field of research can be particularly limiting for women. Research on personality traits, disaggregated by gender, is a focus in psychological entrepreneurship research. This research is particularly important as the percentage of female entrepreneurs is significantly below that of males (Ward et al., 2019).

Susan Bernardino, Freitas Santos, and Cadima Ribeiro investigate gender differences in entrepreneurial ventures and how they are explained by different personality traits. They conducted this research because of a lack of research investigating the influence of gender and personality on entrepreneurs' behavior. Their research ultimately finds that both female and male entrepreneurs have personality traits such as openness to experience, agreeableness, conscientiousness, extraversion and emotional stability. In fact, the only significant difference was agreeableness—where women scored more highly (Bernardino et al., 2018). If men and

women entrepreneurs have similar personality traits, why are there fewer female entrepreneurs than male entrepreneurs?

Langowitz and Minniti conduct research exploring what variables influence the entrepreneurial propensity of women. In their research, they included several perceptual variables; their findings show that perceptual variables have a crucial influence and account for much of the difference in entrepreneurial activity between the sexes. Specifically, they found that women tend to perceive themselves and their environment in a less favorable way than their male counterparts. These results suggest that the perceptual variables may be significant factors influencing entrepreneurial behaviors and outcomes. The findings also suggest that an old argument holds true—that women are less risk tolerant than men. However, their argument is that women's lower risk tolerance is result of a more negative self-perception. Future recommendations would be offered for ways for women to alter the way they think about themselves, their environments, and their roles in society (Langowitz & Minniti, 2007).

Additionally, Zisser, Johnson, Freeman, and Staudenmaier conducted research to determine if women who intend to become entrepreneurs have certain skills or traits that can be fostered. Their research centered on understanding personality; more specifically, they set out to better understand the entrepreneurial personality, examined by gender. Since significant research has been done on personality traits and skills in entrepreneurs, they set out to understand if these traits could be applied to both men and women entrepreneurs. They assessed personality traits through a modified test based on the Big Five Traits, in which the participants were students and staff at a public university in the San Francisco Bay area. The largest takeaway of their research was that women with entrepreneurial intent had higher scores on 'communal tendency' than their male counterparts. The researchers suggest that this could help explain differences in motivations

for women; potentially women are drawn to entrepreneurship for community-oriented business goals whereas men may be attracted to the individualistic predecessors. Since research has shown that women often have less access to financial capital, their communal tendencies may serve as an opportunity to increase their social capital (Zisser et al., 2019). If this is the case, entrepreneurial education should encourage and promote this trait for women entrepreneurs.

Another interesting study, conducted by Moudry and Thaichon, looks at differences in males and females pursuing entrepreneurial ventures in the retail space. The researchers interviewed female entrepreneurs to understand previous or current ventures and experiences. Analysis of the collected responses demonstrated that successful female entrepreneurs were willing to adopt certain masculine traits; in fact, adopting masculine traits increased the women entrepreneurs' chances of success. The most relevant traits that were discussed through research were confidence and risk propensity, which are often tied with masculine traits. The study also looked at enculturated traits in women that grew up in a masculine oriented home versus women that grew up in a feminine oriented home. The researchers found that women who had played with boys or had brothers growing up had learned to be more assertive and to stand up for themselves; these women entrepreneurs reported that these learned skills had carried into their career as an entrepreneur (Moudry & Thaichon, 2020).

As Zisser, Johnson, Freeman, and Staudenmaier pointed out in their research, more research needs to be done on entrepreneurial personality traits to understand if these can be applied to both men and women. In general, there is a large gap in research when it comes to entrepreneurship, traits, skills, and gender. Specifically, there is a large gap at the undergraduate level. This space provides an opportunity to explore the intersection of gender and personality traits in entrepreneurship at the University of Tennessee-Knoxville.

### **Entrepreneurial Education at the Undergraduate Level**

Over the last few decades, entrepreneurship education has grown significantly. One primary reason is that higher education institutions understand the value in, and promote, entrepreneurial learning. Research continues to find that entrepreneurship curriculum has a positive correlation with student's entrepreneurial endeavors and careers. Throughout an entrepreneurial education, students are provided necessary skills, an understanding of how to pursue entrepreneurship, and a motivation to develop their careers.

Researchers Melia Astiana, Maya Malinda, Anny Burbasari, and Meily Margaretha obtained data from 240 undergraduate business students; their study was focused on understanding the connection between entrepreneurship education and entrepreneurial intention. Their research found (through an R-square test) that entrepreneurial education and perceived desirability increased entrepreneurial intentions by 61.12%. The researchers also point out that entrepreneurial education is important because it helps students understand the type of characteristics and skills needed to succeed as an entrepreneur. Students reported feeling more confident about having the right characteristics which leads to increased confidence in future ventures. The researchers argue that with the findings of this study, higher education has a responsibility to teach students about entrepreneurship; specifically, the education should include a focus on understanding entrepreneurial character traits, building business networks, and generating general interest and desire to become an entrepreneur (Astiana et al., 2022).

While there are many ways to teach entrepreneurship, Boldureanu, Ionescu, Bercu, and Bedrule-Grigoruta argue that exposure to successful entrepreneurial role models could be the most significant. Their research found that the introduction of entrepreneurial models increased both the students' intentions and attitudes. Additionally, the role models increased the student's

perception and understanding of social benefits that come with entrepreneurship as opposed to just financial benefits (Boldureanu et al., 2020). Alternatively, researchers Rodriguez-Lopez and Souto contend that undergraduate dissertations connected to a business incubator have the most positive impact on entrepreneurial intentions. Through their research, they found that the students' ability to design and implement an undergraduate dissertation provides (1) a practical experience of entrepreneurship and (2) trains them to have the right skills and knowledge to start their own venture (Rodríguez-López & Souto, 2019). Other research has found many alternatives to the “most important” or “most impactful” aspect of an entrepreneurship curriculum.

While research has found that there are many different methods to creating an effective entrepreneurship education, researchers all agree that there is significant value in the education. Entrepreneurial education is central to the success of undergraduate students' entrepreneurial intentions. Education provides resources to help students become motivated, increase desires to become entrepreneurs, the skills and traits needed to succeed, and access to role models or incubators.

### **The Entrepreneurial Mindset Profile (EMP)**

The Entrepreneurial Mindset Profile is an assessment that measures the entrepreneurial mindset profile. At its most simple definition, it identifies variables that distinguish individuals that would be more naturally drawn to entrepreneurship. For decades, researchers have hypothesized a multitude of characteristics that may lead someone to be more of an inherent entrepreneur; some of these characteristics include independence, need for achievement, risk acceptance or risk tolerance, and unconventionality—just to name a few traits of many. Mark Davis, Jennifer Hall, and Pam Mayer, researchers at Eckerd College, set out to develop an assessment that evaluated these characteristics. Thus, they created the Entrepreneurial Mindset Profile that allows individuals to assess their current skills and “unlock their entrepreneurial potential” (Davis et al., n.d.).

The Entrepreneurial Mindset Profile can be utilized in many different settings. As entrepreneurship continues to grow both in and out of traditional business environments, organizations and individuals can take advantage of the EMP in many different ways. For example, college students can utilize the EMP to better understand their success in relation to a future career. Additionally, professors can use the EMP in educational settings to assess the impact of their entrepreneurship curriculum. Corporate leaders can utilize this to assess their own strengths and skills and also the individuals within their organizations. Lastly, entrepreneurs can use the EMP to understand the degree to which they utilize their entrepreneurial mindset. To best utilize the ways in which the EMP can be used, it is critical to understand what the EMP measures and assesses (Davis et al., n.d.).

The Entrepreneurial Mindset Profile measures two constructs: (1) “innate features” which are the personality characteristics that would make an individual more naturally inclined to



entrepreneurship and (2) the “malleable features” or skills that an individual possesses that would make them more successful as an entrepreneur (Davis et al., n.d.). Put simply, the first scale is the personality scale that measures the inherent traits of an individual; these are the traits that are most likely not changing. The second scale is the skills scale that looks at the learned skills or traits; these are the skills that *can* change over time. The personality scales evaluate independence, preference for limited structure, nonconformity, risk acceptance, action orientation, passion, and need to achieve. Figure 1 displays the personality scales and defines the features that make up this scale.

**Figure 1: Personality Scales – The Who and the Why**

Independence	The desire to work with a high degree of independence
Preference for Limited Structure	A preference for tasks and situations with little formal structure
Nonconformity	A preference for acting in unique ways; an interest in being perceived as unique
Risk Acceptance	A willingness to pursue an idea or a desired goal even when the probability of succeeding is low
Action Orientation	A tendency to show initiative, make decisions quickly, and feel impatient for results
Passion	A tendency to experience one’s work as exciting and enjoyable rather than tedious and draining
Need to Achieve	The desire to achieve at a high level

Additionally, the skills scales evaluate future focus, idea generation, execution, self-confidence, optimism, persistence, interpersonal sensitivity. Figure 2 displays the skills scales and defines the features that make up this scale.

**Figure 2: Skills Scales – The What and the How**

Future Focus	The ability to think beyond the immediate situation and plan for the future
Idea Generation	The ability to generate multiple and novel ideas, and to find multiple approaches for achieving goals
Execution	The ability to turn ideas into actionable plans; the ability to implement ideas well
Self-Confidence	A general belief in one's ability to leverage skills and talents to achieve important goals
Optimism	The ability to maintain a generally positive attitude about various aspects of one's life and the world
Persistence	The ability to bounce back quickly from disappointment, and to remain persistent in the face of setbacks
Interpersonal Security	A high level of sensitivity to and concern for the well-being of those with whom one works

In the assessment, there are 115 items (with multiple sub-items) that each participant responds to; for each item, the respondent is asked how well the item describes them on a five-point scale from 'does not describe me well' to 'describes me very well'. These items are then used to measure the scales in both personality and skills (Davis et al., n.d.-a).

### **Summary of Existing Research**

In a current understanding of psychological entrepreneurship research, there are certain traits or skills that define or are expected of successful entrepreneurs. However, until more recently, research had not been conducted to see if these traits applied to women in the same way. While some research has found that women entrepreneurs report similar or greater traits to their male counterparts, other research has found that women's perception of themselves and their environment is the greatest hinderance to their success as an entrepreneur. Negative perceptions or a lack of certain skills can be combatted through entrepreneurial curriculum. In fact, research has continued to find that entrepreneurial education is the greatest way to increase entrepreneurial intent, skills, and confidence. Thus, universities and colleges have an obligation and an opportunity to provide entrepreneurial education to help meet the demand for entrepreneurs that is so critical to the global economy-- especially for women entrepreneurs. In my research, I hope to better understand certain traits or skills of students at the University of Tennessee-Knoxville, disaggregated by gender, to help inform current curriculum in a way to promote female entrepreneurs and gender equity in entrepreneurship education.

### **Hypothesis Development**

Researchers have continuously found women are less likely to become entrepreneurs than their male counterparts; however, there is a multitude of arguments as to why this is the case (Ward et. al, 2019). As I explore the data of the Entrepreneurship 350 class, I will look at the 14 dimensions across the Entrepreneurial Mindset Profile's "personality scales" and the "skills scales."

Although there could be differences between men and women across all 14 scales, I believe that there will be significant differences between risk acceptance, optimism, and self-confidence. Langowitz and Minniti found that women entrepreneurs tend to perceive themselves and their environments in a less favorable way than men; the researchers argue that these perceptual variables directly influence women's entrepreneurial behaviors and venture outcomes (Langowitz & Minniti, 2007). Thus, I believe that women will score lower on both risk acceptance and optimism—because of a more negative self-perception. Additionally, having examined the work of Zisser, Johnson, Freeman, and Staudenmaier and Moudry and Thaichon, I believe that a lack of confidence is an element affecting women entrepreneurs. While neither study directly reported a difference in confidence, I believe that this is an underlying problem. Thus, at the start of the semester, I believe that women will score lower than their male peers on risk acceptance, optimism, and self-confidence.

However, regardless of the starting point at the beginning of the semester, I believe that women will grow more in persistence and future focus over the course of the four-month semester. Through their research, Zisser, Johnson, Freeman, and Staudenmaier found that women are more drawn to entrepreneurship for community-oriented business goals (as opposed to men who are more attracted for individualistic elements). I believe that a community focused mindset

would provide women with fellow female supporters that encourage them to remain persistent in their ventures. Researchers Mather and Lighthall found women are better at computing risk and taking action when under stress; additionally, they found women make less risky decisions in these situations when compared to males (Mather & Lighthall, 2012). I believe that when paired with an entrepreneurial education, women will be able to effectively plan and think more futuristically than their male peers. Thus, they will have higher growth on future focus following a four-month entrepreneurship course.

In short, I hypothesize that women, at the start of the semester, will score lower than their male peers on risk acceptance, optimism, and self-confidence. I also hypothesize that women, regardless of the starting point, will have more significant growth over the semester on persistence and future focus compared to their male peers.

**Hypothesis 1 (H1): At the beginning of the semester, women will score lower than their male peers on risk acceptance.**

**Hypothesis 2 (H2): At the beginning of the semester, women will score lower than their male peers on optimism.**

**Hypothesis 3 (H3): At the beginning of the semester, women will score lower than their male peers on self-confidence.**

**Hypothesis 4 (H4): At the beginning of the semester, women will score higher than their male peers on interpersonal sensitivity.**

**Hypothesis 5 (H5): Regardless of starting point, women will have more significant growth over the semester on persistence compared to their male peers.**

**Hypothesis 6 (H6): Regardless of starting point, women will have more significant growth over the semester on future focus compared to their male peers.**

### **Methodology**

In order to understand if there are differences between men and women taking undergraduate entrepreneurship classes at the University of Tennessee-Knoxville, I will use a quantitative research method to evaluate results from the Entrepreneurial Mindset Profile. I will look at the average of each scale broken down by gender at the beginning of the semester and at the average change broken down by gender over the course of the semester.

Data used in this thesis is from students in the Fall 2022 Entrepreneurship 350 class at the University of Tennessee-Knoxville. The Entrepreneurship 350 class is “Introduction to Entrepreneurship”; students must have completed 45 credit hours to take this class (roughly three terms). Otherwise, there are no restrictions in terms of class year or area of study. In ENT 350, students took the Entrepreneurial Mindset Profile assessment at the beginning of the semester (in September of 2022) and then again at the end of the semester (in December of 2022).

After the surveys were returned from the EMP, names were removed to protect the privacy of all students. I received access to data on 229 EMP profiles, but only 227 could be used because two individuals did not specify their gender. The data was then imported into Excel, which was used to complete all quantitative data analysis. First, I found the mean of each of the 14 scales disaggregated by gender at the beginning of the semester (labeled T1). Then, I found the average difference [the December test average – the September test average] disaggregated by gender (labeled as T3). Next, I ran a t-test on all of the means. The t-test table provides a p-value for each set of variables; if the p-value is less than 0.05, the result is significant. However, if the p-value is greater than 0.05, the result is insignificant. Last, the researcher created a correlation table for T1 and T3. The correlation table (below) describes if there is a positive,

negative, or no relationship between the variables. In this specific correlation table, any correlation value above 0.3 is significant at the  $p < 0.05$  level.

Findings, limitations, and recommendations for future research can be found below.

## Results

*Hypothesis 1 (H1): At the beginning of the semester, women will score lower than their male peers on risk acceptance.*

H1 was supported as women scored significantly lower on risk acceptance than their male peers at Time 1. See table 1.

*Hypothesis 2 (H2): At the beginning of the semester, women will score lower than their male peers on optimism.*

H2 was not supported; there was no significant difference between men and women on their optimism at Time 1. See table 1.

*Hypothesis 3 (H3): At the beginning of the semester, women will score lower than their male peers on self-confidence.*

H3 was supported as women scored significantly lower on self-confidence than their male peers at Time 1. See table 1.

*Hypothesis 4 (H4): At the beginning of the semester, women will score higher than their male peers on interpersonal sensitivity.*

H4 was supported as women scored significantly higher on interpersonal sensitivity than their male peers at Time 1. See table 1.

Table 1, below, shows the average of the fourteen different scales disaggregated by gender. The fourth column shows the p-value after running a t-test; the highlighted cells are significant p-values, meaning they are less than 0.05, and that the differences in scores for men and women on that specific trait or skill are significantly different from one another.



Table 1: Averages at the Beginning of the Semester (T1)

	<b>Female</b>	<b>Male</b>	<b>P-Value</b>
<b>Independence</b>	2.3568	2.3825	0.7439
<b>Limited Structure</b>	2.5500	2.8920	0.0022
<b>Nonconformity</b>	3.4793	3.5728	0.3125
<b>Risk Acceptance</b>	3.6955	3.8949	0.0332
<b>Action Orientation</b>	3.6214	3.6985	0.3608
<b>Passion</b>	3.7136	3.7036	0.8851
<b>Need to Achieve</b>	4.2727	4.4015	0.0873
<b>Future Focus</b>	3.1795	3.2642	0.4394
<b>Idea Generation</b>	3.3682	3.3606	0.9366
<b>Execution</b>	3.3250	3.3255	1.0000
<b>Self-Confidence</b>	3.3705	3.7606	0.0006
<b>Optimism</b>	3.8818	3.8015	0.4596
<b>Persistence</b>	4.1205	4.2277	0.1532
<b>Interpersonal Sensitivity</b>	4.1477	3.7620	0.0002

*Hypothesis 5 (H5): Regardless of starting point, women will have more significant growth over the semester on persistence compared to their male peers.*

H5 was not supported; there was no significant difference between men and women in the change in their persistence over the course of the semester. See table 2.

*Hypothesis 6 (H6): Regardless of starting point, women will have more significant growth over the semester on future focus compared to their male peers.*

H6 was not supported; there was no significant difference between men and women in the change in their future focus over the course of the semester. See table 2.

Table 2, below, shows the average change of the fourteen different scales over the course of the semester disaggregated by gender. The fourth column shows the p-value after running a t-test; the highlighted cells are significant p-values, meaning they are less than 0.05, and the difference in the change of score in that particular trait or skill is significantly different for men and women in this sample.

Table 2: Average Change (T2-T1) over the Semester

	<b>Female</b>	<b>Male</b>	<b>P-Value</b>
<b>Independence</b>	-0.0190	-0.0044	0.8660
<b>Limited Structure</b>	0.2159	-0.0286	0.0255
<b>Nonconformity</b>	0.1235	0.0681	0.5125
<b>Risk Acceptance</b>	0.0159	-0.0242	0.6480
<b>Action Orientation</b>	0.0689	0.0236	0.5410
<b>Passion</b>	0.0063	-0.1011	0.1753
<b>Need to Achieve</b>	0.0603	-0.0396	0.1909
<b>Future Focus</b>	-0.0952	0.0110	0.3049
<b>Idea Generation</b>	0.0698	-0.0220	0.3218
<b>Execution</b>	0.2952	0.1846	0.1814
<b>Self-Confidence</b>	0.1238	0.0220	0.2491
<b>Optimism</b>	-0.0875	0.1121	0.0452
<b>Persistence</b>	0.0625	0.0527	0.9189
<b>Interpersonal Sensitivity</b>	-0.1333	0.0286	0.0557*

\*marginally significant, less than .10

### Discussion

While some of the hypotheses were supported, there were other interesting findings from the quantitative analysis of the EMP assessment results. While the hypotheses held true that women score lower on risk acceptance and self-confidence at the start of the semester, women unfortunately also scored significantly lower on preference for limited structure. As a result, the curriculum in the Entrepreneurship 350 class could offer experiences, speakers, and activities that can increase these three metrics for all students, but particularly for women. However, it is clear that UTK's undergraduate entrepreneurship courses already offer experiences that encourage women to become more comfortable with limited structure; while it was not hypothesized, there is a significant positive change for women's preference for limited structure between the start and the end of the semester. Activities or assignments in the class are currently challenging female students' comfortability with limited structure; this could be a valuable insight for entrepreneurship education at both the undergraduate and graduate level at universities nationally if future research could identify what is increasing this metric.

Additionally, while not hypothesized, there was a significant difference at the end of the semester between the change that men and women experience in their optimism and interpersonal sensitivity. While at first glance this seems like a negative effect, this decrease may just be a byproduct of (1) women becoming more assertive and self-focused and (2) male peers becoming more interpersonal and optimistic. Regardless, it would still be preferable to see an average increase across all scales—regardless of gender. Thus, it could be important for future research to help identify why women are decreasing in these metrics over the course of the semester.

### **Limitations**

As with many studies, the design of the current study is subject to limitations. The first limitation is that this study is only focused on one academic institution and findings cannot be applied to undergraduate entrepreneurship classes at other universities. It was out of the scope of this project to focus on other universities. Thus, these results can only be utilized by professors at the undergraduate level at the University of Tennessee-Knoxville. The second limitation is that this study is focused on only one class: Entrepreneurship 350 Introduction to Entrepreneurship. Thus, the findings should not be more broadly applied to other classes at the University of Tennessee-Knoxville. They should not be used for other entrepreneurship classes at the University whether at undergraduate or graduate levels. The third limitation is that this assessment does not include those who identify as nonbinary or are gender fluid. The study offered only 'male' or 'female' options and the analysis was conducted using these two options; thus, those who are nonbinary may not feel accurately represented. In the future, the assessment may expand to have more inclusive options. While there are still many valuable insights from this study, it is critical to understand that there are still limitations—as with any study.

### **Recommendations for Future Research**

The current study can be utilized as a first step in research related to gender, entrepreneurial traits, and entrepreneurship education at the undergraduate level. However, the results of the study should still be treated with caution due to the fact that all of the analyzed data was pulled from one institution (University of Tennessee-Knoxville) and reflects a relatively small sample size. Additionally, the data is from just one introductory entrepreneurship class at that institution (although there are several sections of the course, with different instructors, included in the dataset).

There is a plethora of future research that can be done with the Entrepreneurial Mindset Profile Assessment at the University of Tennessee-Knoxville. This data set will continue to grow dramatically each semester as more students take the assessment; additionally, there are many other directions and ways this data can be analyzed. For example, the data could be further disaggregated by (1) race or ethnicity, (2) college (specifically business vs non-business majors), (3) year in school, and (4) socioeconomic status—just to name a few ideas. Additionally, the data could be disaggregated by whether the student has a family member or close mentor who identifies as an entrepreneur or is already an entrepreneur him or herself. It would also be fruitful to gather data sets from higher-level entrepreneurship classes; future research could focus on differences in skills between introductory courses and more advanced courses.

These are just a few, of many, recommendations for future research. This data set will continue to grow and change as long as the Entrepreneurial Mindset Profile Assessment is used in Entrepreneurship classes at the University of Tennessee-Knoxville. Not only does this provide many interesting areas for future research, but also an opportunity to provide more insight and information to UTK's Management and Entrepreneurship department; this research can help

inform the department to make entrepreneurship classes as developmental and inclusive as possible.

### **Conclusion**

In conclusion, in this thesis, I explored the relationship between gender and entrepreneurship at the undergraduate level at the University of Tennessee-Knoxville. The study aimed to identify the ways gender affects entrepreneurial skills and traits and identify the ways entrepreneurial education impacts men and women. The findings of the study suggest that gender does indeed play a significant role in entrepreneurial traits and the growth of these traits over the course of the semester.

In my findings, I revealed that female students scored significantly lower than male students on preference for limited structure, risk acceptance, and self-confidence, but higher on interpersonal sensitivity. I also found that following entrepreneurial education, female students grew significantly more than men in their preference for limited structure and decreased in optimism and interpersonal sensitivity. These findings emphasize the importance of developing a curriculum that helps increase women's preference for limited structure, risk acceptance, and self-confidence—while keeping their optimism high. Addressing these differences between genders will hopefully create a more level playing field for aspiring women entrepreneurs and make UTK's undergraduate entrepreneurship classes more developmental and inclusive.

Overall, the findings of this study have significant implications for universities across the country; while the findings cannot be generalized to all universities, research should be done across universities to understand differences in EMP starting points and changes during entrepreneurship education due to gender. By promoting and creating a more inclusive

environment in entrepreneurship classrooms, all individuals will be more likely to pursue entrepreneurial endeavors—regardless of gender. Future research in this area could continue to explore additional factors gender or could be further disaggregated by other social categorizations such as race or class.



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## Tables

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**THE EMP MODEL**



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**SCALES AND DEFINITIONS**

The EMP measures two constructs: 1) the largely innate features (Personality characteristics) that would make an individual more likely drawn to entrepreneurial endeavors and 2) the more malleable features (Skills) that would make an individual more likely to be successful as an entrepreneur. There are 14 dimensions with seven in each of these two categories.

**Personality Scales - The Who and the Why**

Independence	The desire to work with a high degree of independence
Preference for Limited Structure	A preference for tasks and situations with little formal structure
Nonconformity	A preference for acting in unique ways; an interest in being perceived as unique
Risk Acceptance	A willingness to pursue an idea or a desired goal even when the probability of succeeding is low
Action Orientation	A tendency to show initiative, make decisions quickly, and feel impatient for results
Passion	A tendency to experience one's work as exciting and enjoyable rather than tedious and draining
Need to Achieve	The desire to achieve at a high level

**Skills Scales - The What and the How**

Future Focus	The ability to think beyond the immediate situation and plan for the future
Idea Generation	The ability to generate multiple and novel ideas, and to find multiple approaches for achieving goals
Execution	The ability to turn ideas into actionable plans; the ability to implement ideas well
Self-Confidence	A general belief in one's ability to leverage skills and talents to achieve important goals
Optimism	The ability to maintain a generally positive attitude about various aspects of one's life and the world
Persistence	The ability to bounce back quickly from disappointment, and to remain persistent in the face of setbacks
Interpersonal Sensitivity	A high level of sensitivity to and concern for the well-being of those with whom one works

Table 1: T1 Correlation Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Independence	1.000													
2 Limited Structure	0.496	1.000												
3 Nonconformity	0.300	0.482	1.000											
4 Risk Acceptance	0.211	0.401	0.463	1.000										
5 Action Orientation	0.161	0.307	0.341	0.475	1.000									
6 Passion	-0.023	0.206	0.246	0.350	0.360	1.000								
7 Need to Achieve	-0.066	0.065	0.349	0.165	0.274	0.327	1.000							
8 Future Focus	0.078	0.115	0.218	0.153	0.156	0.346	0.274	1.000						
9 Idea Generation	0.244	0.425	0.346	0.302	0.258	0.224	0.012	0.022	1.000					
10 Execution	0.116	0.231	0.338	0.319	0.541	0.486	0.233	0.239	0.439	1.000				
11 Self-Confidence	0.090	0.231	0.328	0.409	0.448	0.383	0.294	0.201	0.183	0.376	1.000			
12 Optimism	-0.070	0.062	0.077	0.198	0.204	0.258	0.033	0.085	0.193	0.230	0.335	1.000		
13 Persistence	0.037	0.171	0.392	0.365	0.532	0.531	0.490	0.340	0.218	0.584	0.567	0.268	1.000	
14 Interpersonal Sensitivity	-0.221	-0.200	-0.221	-0.186	-0.065	0.081	-0.001	-0.033	-0.118	-0.083	-0.030	0.218	0.016	1.000

All correlations about 0.3 are significant and highlighted yellow.