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Assessment of Iso-Ahola's Theory of Tourism Motivation on Willingness to Fly as a Point-to-Point Suborbital Space Tourist

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Assessment of Iso-Ahola's Theory of Tourism Motivation on Willingness to Fly as a Point-to-Point Suborbital Space Tourist

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Assessment of Iso-Ahola's Theory of Tourism Motivation on Willingness to Fly as a Point-to-Point Suborbital Space Tourist

By

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Abstract

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Suborbital space tourism involves flight in an air vehicle to an altitude exceeding 100 kilometers (62 miles). This altitude is referred to as the Karman Line and the edge of space. Point-to-point space travel is transportation in an air vehicle where the vehicle flies around the earth in space to decrease the time to travel from one point on the earth's surface to another point on the earth's surface. The commercial space flight industry has a vision for point-to-point space travel.

The study aimed to assess the influence of the four dimensions of Iso-Ahola's (1982) theory of tourism motivation on willingness to fly as a point-to-point suborbital space tourist. The theory of tourism motivation was the primary theoretical construct for this study. Age, gender, and annual gross income served as control variables.

A quantitative methodology and non-experimental, cross-sectional study design was executed using 870 participants from Amazon's ® Mechanical Turk ®. Structural equation modeling was used to analyze the survey results to test the proposed theoretical model.

The study revealed that, in order of effect size, interpersonal seeking, personal seeking, and interpersonal escape influenced willingness to fly as a point-to-point

suborbital space tourist. Iso-Ahola's original (1982) *theory of tourism motivation* proposed that tourism has two motivational forces: *seeking* and *escaping*. A person may seek to visit a location or engage in a leisure activity that produces satisfaction or escape a current environment for a location or leisure activity that produces satisfaction. The results of this study suggest *seeking* is predominant within these dialectic motivational forces as interpersonal seeking and personal seeking had the greatest direct standardized effect on willingness to fly. Additionally, the theory also applies a personal or interpersonal dimension. The study suggests that interpersonal is the predominant dimension as personal escape did not have a statistically significant influence on willingness to fly, and interpersonal seeking and interpersonal escape did. The control variable, annual gross income, did not have a statistically significant effect on willingness to fly. Age and gender did have a slightly negative statistically significant effect on willingness to fly but did not contribute significantly to the final model. The squared multiple correlations (R^2) for the endogenous (predicted) variable, willingness to fly, was 0.402; the model demonstrated, in order of effect, interpersonal seeking, personal seeking, and interpersonal escape explain 40% of the variance in willingness to fly as a point-to-point suborbital space tourist.

The study created a model to assess tourists' motivation toward a willingness to fly as a point-to-point suborbital space tourist. The partial validation of the theory of tourism motivation and willingness to fly scale provides application in future space tourism research. Finally, from a practical perspective, the results provide validated data to target marketing to policymakers and potential point-to-point space tourists and investors.

Keywords: suborbital space flight, point-to-point space flight, suborbital space tourism, tourism motivation, willingness to fly.

Dedication

This dissertation is dedicated to dreamers. Continue to take the steps of uncertainty toward whatever it is you seek.

Acknowledgments

My deepest appreciation goes to my wife, Jennifer, and daughter, Tavia. Life has provided us with numerous challenges throughout this Ph.D. journey. I sincerely respect their continual support and sacrifice as we navigated these challenges and wove my Ph.D. work into the fabric of our life. Thank You!

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Chapter I: Introduction

Suborbital space tourism is becoming a reality and will be a catalyst for space industry growth from $340 billion to almost $1 trillion over the next 20 years. Jeff Bezos initially invested $500 million of his own money to found Blue Origin (Berrisford, 2018). Blue Origin expanded investment in suborbital space tourism in 2020 with the opening of a new headquarters building at the cost of $14 million (Boyle, 2020). Virgin Galactic had an original investment of $280 million to develop commercial suborbital space travel and later received a capital injection of $1 billion in 2017 (Berrisford, 2018). Further support for Virgin Galactic came from a $20 million investment from Boeing to advance point-to-point space travel (Wall, 2019).

Suborbital space tourism involves a flight to the Karman line and approximately 5 minutes of microgravity as the vehicle falls back toward earth. Virgin Galactic and Blue Origin conducted the first commercial suborbital space tourism flights with passengers in July 2021 (Foust, 2021a, 2021b). The next step in commercial space tourism is point-to-point suborbital space flight. However, there is little research on the influence of tourism motivation on willingness to fly as a point-to-point suborbital space tourist. Prior tourism motivation research identified various motivational constructs that influence a space tourist, but none used tourism motivation theory as the basis. Additionally, prior research focused on space tourism in general and not specifically on point-to-point suborbital space tourism. Finally, previous empirical research is scant on potential space travelers from the United States (Ao, 2018; Baugh et al., 2018; Y.-W. Chang, 2017; Laing & Frost, 2019; Olya & Han, 2020; Reddy et al., 2012; Zhang & Wang, 2020).

Companies have invested billions of dollars in making commercial space tourism a reality (E. Chang, 2020); therefore, it is beneficial for them to know the type of person willing to fly as a suborbital space tourist. Research in consumer motivation supports investments in point-to-point suborbital space tourism through understanding of the type of person willing to fly as a commercial suborbital space tourist.

Statement of the Problem

The specific problem addressed in this research is that there is no tourism motivation theory validated for application with willingness to fly as a point-to-point suborbital space tourist. Understanding the influence of tourism motivation on willingness to fly as a point-to-point suborbital space tourist provides insights into who will choose to purchase a point-to-point suborbital space flight. Due to a predicted increase in point-to-point suborbital space tourism, increased knowledge of who will fly can provide a focus for industry development (Berger, 2019, 2020; Bergin, 2020; Etherington, 2020; Laing & Frost, 2019; Virgin Galactic, 2020b; Wall, 2020; Zhang & Wang, 2020). To date, no studies have researched tourist motivation and willingness to fly as a point-to-point suborbital space tourist. This study fills a knowledge gap by providing space tourism companies with insightful information on potential tourists. Space tourism companies can use this information for marketing, potential investors, training, and flight experience.

Purpose Statement

This study aimed to assess the influence of the four dimensions of Iso-Ahola's (1982) theory of tourism motivation on willingness to fly as a point-to-point suborbital space tourist. The theory of tourism motivation is the primary theoretical construct. Age, gender, and annual income served as control variables.

A quantitative methodology and non-experimental, cross-sectional study design was executed using 870 participants from Amazon ® Mechanical Turk ®. The primary data collection instrument was an electronic survey. Structural equation modeling was used to analyze the survey results and test the proposed theoretical model.

Significance of the Study

Study results provide theoretical and practical implications, which expand the body of knowledge related to point-to-point suborbital space tourism.

Theoretical Implications

The application of the theory of tourism motivation and willingness to fly scales contribute to the body of knowledge for suborbital space tourism. The model developed for this research uses a scale validated for use with point-to-point suborbital space tourism to assess the theory of tourism motivation. Although space tourism research has increased over the past five years, it is still an area with minimal research, especially empirical research. There is a need for increased empirical studies focusing on, among other constructs, push factors influencing consumers' behavior toward space travel (Zhang & Wang, 2020).

The hypothesized model extended the use of Iso-Ahola's (1982) theory of tourism motivation to assess the influence of motivation on willingness to fly as a point-to-point suborbital space tourist. While the willingness to fly scale has been used in other forms of commercial space travel research, it has not been used with point-to-point suborbital space tourism. The study results demonstrate the successful use of the willingness to fly scale in the context of point-to-point suborbital space tourism.

Finally, in the analysis, age, gender, and annual income were controlled for, thus assessing the theory while restricting the influence of potential confounding variables. The validation of the theory of tourism motivation and willingness to fly scale provides application for future space tourism research and supports recommendations for more empirical research from distinct perspectives to expand the conversation of space tourism (Laing & Frost, 2019; Zhang & Wang, 2020).

Practical Implications

People from the United States are the most likely initial suborbital space tourists compared to space tourism participants from other countries (LeGoff & Moreau, 2013; The Tauri Group, 2014). To date, the only commercial suborbital space flights have occurred in the United States (Foust, 2021a, 2021b). However, only one empirical research study assessing the motivations of space travelers from the United States was discovered (Olya & Han, 2020). Therefore, the study results provide a baseline for United States residents' tourism motivation and willingness to fly as a point-to-point suborbital space tourist. Additionally, the influence of Iso-Ahola's (1982) theory of tourism motivation on willingness to fly as a point-to-point space tourist was validated,

establishing a baseline to assess other contributing factors, such as individual culture and curiosity. As such, the results facilitate targeted marketing to policymakers and potential point-to-point space tourists and investors.

Research Questions and Hypotheses

Research questions

The study investigated two primary research questions:

1. What dimensions of tourist motivation influence willingness to fly as a point-to-point suborbital space tourist?
2. To what extent do these dimensions influence willingness to fly as a point-to-point suborbital space tourist?

Hypotheses

The study investigated four hypotheses:

H_1: There is a significant positive relationship between personal seeking and willingness to fly.

H_2: There is a significant positive relationship between interpersonal seeking and willingness to fly.

H_3: There is a significant negative relationship between personal escape and willingness to fly.

H_4: There is a significant negative relationship between interpersonal escape and willingness to fly.

Note: Hypotheses were tested while controlling for age, gender, and annual income.

Delimitations

Four delimitations listed here define the study boundaries. First, the choice of using the four dimensions of Iso-Ahola's (1982) theory of tourism motivation and their influence on willingness to fly as a point-to-point suborbital space tourist was a delimitation. There are other theories and methods that assess tourism motivation, which are discussed in the Chapter 2. However, this study assessed only Iso-Ahola's theory of tourism motivation to be used universally for point-to-point suborbital space tourism research. Second, the use of a cross-sectional study design was a delimitation. A cross-sectional study design is a temporal limitation as the survey is issued for a finite time period. This limitation can be reduced through future research on point-to-point suborbital space tourism motivation.

Third, survey participants were delimited to people 18 years of age or older residing in the United States. The study established this delimitation because people from the United States are the most likely, initial suborbital space tourism participants when compared to other countries (LeGoff & Moreau, 2013; The Tauri Group, 2014), and the United States has an emerging suborbital space tourism industry (Berrisford, 2018; E. Chang, 2020; Gray, 2020; Sheetz, 2020).

Fourth, the participants were also delimited to a convenience sample through Amazon ® Mechanical Turk ® and constrained to a single point in time. Amazon ® Mechanical Turk ® provided access to participants who are diverse across education, demographic, and dispositional variables (Mason & Suri, 2012; Mehta et al., 2019; Sheehan, 2018); the ability to acquire many samples expeditiously with results similar to laboratory or offline studies (Buhrmester et al., 2011; Germine et al.,2012; Mason & Suri,

2012; Ramsey et al., 2016); equal internal and external validity when comparing online survey platforms to other convenience samples within the field of applied psychology (Walter et al., 2019); and access to a broad population providing the opportunity to increase generalizability with increased external validity (Rice et al., 2017). While physical access may ensure more of the population is accessed locally, it was impractical to reach the breadth of the United States population without electronic means.

Limitations and Assumptions

Selection bias and generalizability were two primary limitations of the study. With the use of Amazon ® Mechanical Turk ®, a convenience sampling strategy may have introduced selection bias (Vogt et al., 2012). The participants decided to participate based on the title and explanation of the survey, payment for survey completion, the perceived survey completion time, and other potential motivational factors. A generic description of the survey was used to ensure potential participants could assess the nature of the study without the survey being more or less attractive to respondents of a particular demographic or characteristic decreasing sampling bias (Goodman & Paolacci, 2017). Additionally, only workers with a greater than 98% approval rating who have completed greater than 100 HITs were accepted to complete the survey. The participants were informed they would be compenstaed $0.50 for completing the survey. This compensation is in line with previous research. Sheehan (2018) recommends paying $0.15 per minute of work, but the median hourly wage for workers is reported as approximately $2.00 per hour (Hara, 2018). The instructions indicated that the survey would take about 10 minutes to complete. Amazon ® Mechanical Turk ® provides results similar to laboratory or offline studies in less time than in-person, telephone,

discussion board postings, or electronic mail data collection methods (Buhrmester et al., 2011; Germine et al., 2012; Mason & Suri, 2012; Ramsey et al., 2016).

Generalizability or external validity is a common limitation of survey research (Vogt et al., 2012). Amazon's ® Mechanical Turk ® provided access to a pool of diverse participants across education, demographic and dispositional variables (Mason & Suri, 2012; Mehta et al., 2019; Sheehan, 2018). Additionally, Walter et al. (2019) reported equal internal and external validity when comparing online survey platforms to other convenience samples within the field of applied psychology. Finally, Amazon ® Mechanical Turk ® provided access to a broad population providing the opportunity to increase generalizability with increased external validity (Rice et al., 2017).

The primary assumptions were that participants would answer the questions truthfully and that point-to-point suborbital space tourism would become viable. Although participants have little incentive to be less than truthful, this is a limitation of any research study that uses an online survey. Lack of human interaction could result in misinterpretation of questions or exaggeration of willingness to fly. The use of a pilot study will counter the potential for misunderstanding of questions. Additionally, ensuring participants understood the data was anonymous and no personally identifying data was gathered helped ensure there was no incentive to lie or exaggerate willingness to fly.

Another assumption is that point-to-point suborbital space tourism will become a viable industry. While point-to-point suborbital space tourism is not currently viable, short suborbital space flights, which landed close to the departure point, occurred in July 2021 (Foust, 2021a, 2021b). Point-to-point suborbital space tourism is predicted to be available in 2030 (Berger, 2019, 2020; Bergin, 2020; Etherington, 2020; Wall, 2020).

Summary

Chapter I provided an introduction to the research study. The background discussed the emerging point-to-point suborbital space tourism industry. The statement of the problem explained the need to identify the dimensions of tourism motivation that influence willingness to fly as a point-to-point suborbital space tourist. The purpose statement provided the reason for the study and presented the theoretical and practical significance. The chapter listed the research questions and hypotheses and concluded with delimitations, limitations, and assumptions while closing out with a list of terms and acronyms.

Definitions of Terms

Interpersonal Escape	A tourist evading friends, family, and/or co-workers (Iso-Ahola, 1982; Musselman & Winter, in press; Snepenger et al., 2006).
Interpersonal Seeking	A tourist pursuing interaction with new people in a tourism group or location (Iso-Ahola, 1982; Musselman & Winter, in press; Snepenger et al., 2006).
Personal Escape	A tourist evading personal concerns and difficulties (Iso-Ahola, 1982; Musselman & Winter, in press; Snepenger et al., 2006).
Personal Seeking	A tourist pursuing rest and relaxation, ego-enhancement, and/or novelty (Iso-Ahola, 1982;

	Musselman & Winter, in press; Snepenger et al., 2006).
Suborbital Space Tourism	Flight in an air vehicle to an altitude exceeding 100 kilometers (62 miles), the Karman Line (Chang & Chern, 2018).
Theory of Tourism Motivation	Proposes that tourism has two motivational forces: seeking and escaping (Iso-Ahola, 1982). Seeking and escaping has a personal or interpersonal dimension. The theory provides for tourists' motivation to exist in four dimensions (Iso-Ahola, 1982).
Tourism Motivation (TM)	Group of characteristics that drive an individual to participate in a tourist activity to achieve a goal and satisfy a need (Khuong & Ha, 2014).
Willingness to Fly (WTF)	Choosing to fly in a point-to-point suborbital space vehicle voluntarily.

List of Acronyms

AGFI	Adjusted Goodness of Fit Index
AMOS	Analysis of Moment Structure
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CR	Construct Reliability
GFI	Goodness of Fit Index
HIT	Human Intelligence Task
IE	Interpersonal Escape
IS	Interpersonal Seeking
IRB	Institutional Review Board
MSV	Maximum Shared Variance
NFI	Normed Fit Index
PE	Personal Escape
PS	Personal Seeking
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Modeling
SPSS	Statistical Package for the Social Sciences
TM	Tourism Motivation
WTF	Willingness to Fly

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Chapter II: Review of the Relevant Literature

The literature review discussed in Chapter II establishes the basis for the study by providing an overview of the gaps in the literature, a brief background on suborbital space travel, the theoretical foundation and relevant research theories, and the applicability of variables assessed. Suborbital space travel is an emerging industry; Virgin Galactic and Blue Origin flew the first suborbital space tourism flights with passengers in July 2021 (Foust, 2021a, 2021b). Suborbital space tourists travel 100 kilometers (62 miles) above the earth's surface and experience approximately 5 minutes of microgravity before landing relatively close to the departure location. The next phase of suborbital space travel is point-to-point space travel, where the vehicle travels around the earth in space from one point on the earth's surface to another point on the earth's surface.

The background on suborbital space travel is followed by a discussion on motivation theory in general and tourism motivation in particular, including a discussion of the theory of tourism motivation, the theoretical foundation of the study. A tourist's motivation is essential to understand; it has a significant influence on whether or not new technologies, such as point-to-point suborbital space tourism, succeed or fail (Rice et al., 2019). Next, an overview of the willingness to fly scale is presented. Finally, age, gender, and annual income are discussed as control variables.

Suborbital Space Travel

During the 13th Humans in Space Symposium in May 2000, a speech by Rogers (2001) referenced the first use of the word space tourism. Rogers (2001) referred to a discussion in 1965 about using military and civil space technologies after the end of the

Cold War to transport the general public to space. However, there were no space tourists until 2001, when Dennis Tito, a billionaire businessman, spent nearly 8 days on the International Space Station at the cost of $20 million. Tito and the other eleven paying passengers who spent time on the International Space Station are the first orbital space tourists. Suborbital space tourism essentially emerged from the Ansari XPRIZE for private spaceflight in 2004. Space tourism is less than two decades old (Ansari XPRIZE, 2018; Berrisford, 2018; E. Chang, 2020; Y.-W. Chang, 2015).

There is interest in suborbital space tourism (Crouch et al., 2009). The two most prominent suborbital space travel companies are Blue Origin and Virgin Galactic, but multiple companies are working to provide suborbital space tourism. Space tourism companies have invested billions of dollars trying to be the first private organization to offer routinely scheduled and affordable suborbital spaceflights (E. Chang, 2020). As recognized by the Fédération Aéronautique Internationale, *suborbital space tourism* is a flight in an air vehicle to an altitude exceeding 100 kilometers (62 miles), the Karman Line, and the edge of space (Chang & Chern, 2018). A suborbital space tourist is a person paying to be brought "to sufficiently high altitudes [Karman Line] to watch the Earth's curvature and the blackness of space" (Y.-W. Chang, 2015, p. 79).

Suborbital space tourism involves a flight to the Karman line and approximately 5 minutes of microgravity as the vehicle falls back toward earth. At some point near the end of microgravity, the tourists will reattach their seatbelts for the return ride to the earth's surface near the point of departure (Blue Origin, 2020; Virgin Galactic, 2020a). The desire for commercial space travel exists in multiple countries, with people from the United States having the strongest desire for suborbital space tourism (LeGoff & Moreau,

2013; The Tauri Group, 2014). Virgin Galactic and Blue Origin conducted the first commercial suborbital space tourism flights with passengers in July 2021(Foust, 2021a, 2021b).

The commercial space flight industry has a vision for point-to-point space travel. *Point-to-point space travel* uses a vehicle that flies around the earth in space to decrease the time flown from one point on the earth's surface to another point on the earth's surface. Based on the dynamics for space flight around the earth, a space vehicle cannot travel around the earth in less than 90 minutes and will most likely need to fly at an altitude of approximately 200 km (125 miles) (Webber, 2010). Industry experts speculate point-to-point suborbital space travel will be viable by 2030. Some predict that at least 50% of Virgin Galactic's stock value is based on point-to-point travel. Virgin Galactic is developing high-speed aircraft intended to fly at 60,000 feet with partners Rolls Royce and NASA. The concept is to fly higher and faster, providing a foundation for incremental growth toward point-to-point suborbital space travel (Virgin Galactic, 2020b). NASA signed the Space Act Agreement on May 5, 2020, with Virgin Galactic and The Spaceship Company, a subsidiary of Virgin Galactic, to develop a vehicle capable of point-to-point suborbital space flight. SpaceX is planning point-to-point space travel with its Starship rocket from spaceports floating in the ocean (Berger, 2019, 2020; Bergin, 2020; Etherington, 2020; Wall, 2020). Finally, Dawn Aerospace has developed the Aurora for same-day suborbital space flights from multiple existing airports. The Mk-II is a technology demonstration vehicle, which has flown five test flights, but has not flown above 100km. Dawn Aerospace intends to build the Aurora Mk-III for regular suborbital space flight, which is much larger than the Mk-II, (Dawn Aerospace, 2021).

Some industry experts have expressed doubt about the timeline to viable point-to-point space travel. Federal Aviation Administration (FAA) executives are ~~more~~ focused on suborbital space travel, supporting companies like Virgin Galactic and Blue Origin. Although it is not too soon to think about point-to-point suborbital space travel, some industry leaders speculate it is further off than the 2030 estimate (Berger, 2020; Dinkin, 2019; Howell, 2019). Point-to-point space travel will eventually happen as it is motivated by the potential for a $20 billion a year market. The concept of point-to-point space travel is similar to aircraft travel 100 years ago, when aircraft travel itself was viewed as a form of tourist activity before air travel developed into a mature transportation market (Johnson & Martin, 2016; Sheetz, 2019). Passengers desire to seek the adventure, gratification, social connection, and novelty of space flight, and desire to seek knowledge (understanding and familiarity) about space flight. They feel point-to-point suborbital space travel is more beneficial than short suborbital tourism space flights (European Commission, 2014; Musselman & Hampton, 2020).

Motivation Theories

Motivation has roots in various forms of psychology (cognitive, social, behavioral), sociology, and social anthropology. Each area provides a viable influence on the study of motivation and a different perspective on the complex description of human nature (Fullerton, 2013; Martineau, 1957). Moreover, each area contributed to the foundation of motivation theories, which, over time, developed toward tourism motivation theories.

In general, *motivation* is a driving force moving a person to satisfy needs in pursuit of a goal (Hsu et al., 2010; Khuong & Ha, 2014; Lubbe, 1998; Snepenger et al., 2006; Yoon & Uysal, 2005). Motivation theories seek to define what moves people to act or what gives direction to human behavior. The Yerkes-Dodson Law and Drive Theories were the early theories of motivation and provided the foundational constructs which emerged throughout time (Ryan & Deci, 2017). An individual is motivated when they seek some form of a goal to satisfy a need. Then, some form of drive is present to move the individual to pursue the original goal they established to satisfy their need (Fodness, 1994). These three constructs (drive, goal, and need) are seen in future motivation theories, such as Maslow's hierarchy of needs, expectancy theory, the self-determination theory, and Plog's allocentric/psychocentric scale (Muchinsky, 2006; Plog, 2001; Robbins & Judge, 2013; Ryan & Deci, 2017). However, researchers needed an operationally relevant theory specific to tourism motivation.

Several tourism motivation theories used Maslow's hierarchy of needs as the basis for their work (Beard & Ragheb, 1983; Pearce & Caltabianco, 1983; Pearce & Lee, 2005). Maslow endorsed that human beings have a hierarchy of five basic needs. An individual's motivation is reduced when their need is satiated by accomplishing the goal, they established to meet the need. Although influential in developing tourism motivation theories, a valid and reliable tourism motivation model based on Maslow's hierarchy has yet to demonstrate operational relevance (Fodness, 1994; Ryan, 1998; Yousaf et al., 2018).

Expectancy theory holds that people's drive is based on the strength of the expectation of a given outcome (Robbins & Judge, 2013). The theory revolves around effort, performance, and rewards. Expectancy theory has not translated well into tourism motivation. There variables assessed with expectancy theory tend to be too numerous thus making it difficult to measure tourism motivation, and the model complexity makes it difficult to predict individual behavior (Kay, 2003).

The self-determination theory focuses on autonomy, competence, and relatedness. Concerning autonomy, people tend to be more driven when they have the autonomy to act and less driven when their actions are controlled. Humans desire to be effective and seek mastery. In other words, they have a need for competence. Finally, relatedness is about social connection; it is about seeking the goal of a sense of belonging within a social organization (Ryan & Deci, 2017). The self-determination theory is complex, but, in the simplest form, it can be referenced to intrinsic and extrinsic motivation. Self-determination theory research related to tourism motivation has yet to operationalize a model for tourism motivation.

Plog's allocentric/psychocentric scale is often referenced as a motivational theory (Andreu et al., 2005; Yoo et al., 2018). However, it was not developed theoretically based on previous motivational theories, but designed to answer the question, in the late 1960s, of who was not flying on airplanes in the United States and why. The result was a personality spectrum from psychocentric on one end and allocentric on the other (Plog, 2001). It is often referred to as a psychographic continuum (Jeong, 2014; Park & Jang, 2014). Plog (2001) renamed psychocentric as dependables and allocentrics as venturers. *Dependables* tend to rely on others and prefer predictable, familiar, and routine vacations.

Venturers tend to rely on themselves and prefer uncertain, unusual, adventuresome vacations (Plog, 2001). Research shows Plog's psychographic continuum does not predict tourist behavior well (Litvin, 2006; Litvin & Smith, 2016; Park & Jang, 2014; Smith, 1990).

Tourism Motivation

The early days of tourism motivation research were supported by a transition of university work on motivation to consultants to answer the why behind consumer choices. Like other motivation theories, tourism motivation's foundation was psychology, sociology, and anthropology (Fullerton, 2013; Thanabordeekj & Nipasuwan, 2017). As motivation is a starting point to research people's travel choices (Khuong & Ha, 2014; Kim et al., 2006), researchers sought to discover what makes tourists travel. Researchers desired to develop a theoretical framework to answer this question, encouraging the development of multiple tourism motivation theories (Beard & Ragheb, 1983; Crompton, 1979; Dann, 1977; Iso-Ahola, 1982; Pearce & Caltabianco, 1983; Yousaf et al., 2018).

A theory developed as a theoretical framework for motivation was the push-pull theory. *Push factors* predispose an individual to travel and result in a decision to take a vacation. *Pull factors* draw an individual to a particular location and result in a decision to seek that location over another place. *Push factors* are internal and exclusive, or innate, to a traveler and help explain the motives behind going on vacation; *pull factors* are external factors, which originate from the actual destination, and explain the selection of the vacation destination (Crompton, 1979; Dann, 1977; Jamrozy & Uysal, 1994; Klenosky, 2002; Yousefi & Marzuki, 2015). Push factors initially drive tourism

motivation and are, at a minimum, antecedents to pull factors. Push factors are primary motivational factors while pull factors act as secondary motivational factors (Dann, 1977; Jamrozy & Uysal, 1994).

Dann (1977) originally defined push factors as anomie and ego-enhancement. Anomie and ego-enhancement separate push factors into two distinct categories. Anomic tourists' motivations stemmed from the need to get away (from life, work, home environment) and interact with people (other tourists, resort staff, residents) not in their everyday environment. Ego-enhancement tourists' motivations stemmed from prestige and increased status (Dann, 1977).

Crompton's (1979) qualitative research supported the concept of anomie and ego-enhancement as he discovered people's vacation satisfaction was obtained primarily from seven social or psychological motives unique to the traveler rather than the destination. These socio-psychological motives are similar to Dann's (1977) anomie and ego-enhancement push factors. The seven socio-psychological motives are "escape from a perceived mundane environment; exploration and evaluation of self; relaxation; prestige; regression; enhancement of kinship relationships; and facilitation of social interaction" (Crompton, 1979, p. 416). Escape from a perceived mundane environment, relaxation, enhancement of kinship relationships, and facilitation of social interaction fall within the concept of anomie. Exploration and evaluation of self, prestige, and regression fall within the concept of ego-enhancement. Dann (1977) and Crompton (1979) established foundational research demonstrating anomie and ego-enhancement as push factors to tourism motivation and as the initial factors to seek vacation or pleasure travel compared

to pull factors. Iso-Ahola (1982) capitalized on push factors as antecedents to pull factors by developing a model of push factors. The model can be used universally and empirically in tourism motivation research.

Theoretical Foundation

Theory of Tourism Motivation

Iso-Ahola (1982) developed the *theory of tourism motivation*, which proposes tourism has two motivational forces: *seeking* and *escaping*. A person may seek to visit a location or engage in a leisure activity that produces satisfaction or escape a current environment for a location or leisure activity that produces satisfaction. The theory also applies a personal or interpersonal dimension. Combined with the two motivational forces, the theory provides for tourist motivation to exist in four dimensions. A tourist might escape the personal aspect (personal concerns and difficulties) or the interpersonal aspect (friends, family, co-workers). A tourist might seek the personal aspect (rest and relaxation, ego-enhancement, recharging), or a tourist might seek the interpersonal aspect (interacting with new people in a tourism group or at a tourism location).

As mentioned previously, Maslow's hierarchy of needs is the basis for several tourism motivation theories. Pearce's travel career ladder is one such theory. Although this theory loses value as a theoretical framework for tourism motivation because of the lack of research to support the operationalization of Maslow's hierarchy of needs, an element of Pearce's travel career ladder supports Iso-Ahola's (1982) theory as a theoretical framework for tourism motivation. In research on Pearce's travel career ladder, the most important factors in people's formation of reasons to travel (push

factors) were escape/relax, novelty, relationship, and self-development (Pearce & Caltabiano, 1983; Pearce & Lee, 2005). Although not perfectly aligned with Iso-Ahola's (1982) four dimensions, escape/relax is similar to escaping, novelty is similar to seeking, a relationship is similar to interpersonal, and self-development is similar to personal. These factors parallel the factors operationalized in Iso-Ahola's (1982) theory of tourism motivation and further support it as a basis for assessing tourism motivation.

Additionally, self-determination theory was previously mentioned as a motivational theory. One study looked at tourism motivation related to geotourism and concluded that the participants' most prominent intrinsic motivations were escape, relaxation, enjoyment, a sense of wonder, and gaining knowledge (Allan, 2011). The motivation to escape is similar to escape from Iso-Ahola (1982), and the remaining intrinsic motivations match the seeking tenet from Iso-Ahola (1982). In the context of self-determination theory, the study also measured the desire to meet new people with similar interests and to travel with friends (Allan, 2011). These motivations are comparable to the interpersonal tenet from Iso-Ahola's (1982) theory of tourism motivation but do not fully capture the personal and interpersonal dialectic. Many aspects of the self-determination theory are present in Iso-Ahola's theory of tourism motivation, but research has operationalized Iso-Ahola's (1982) theory of tourism motivation.

Iso-Ahola (1982) further described the dialectic nature of seeking and escape as an optimizing process. The tourist's desires are to optimize the interplay of these two motivational forces to gain the most desirable psychological reward. The same dialectic optimizing process holds for the personal and interpersonal aspects. This optimizing

process supports the concept that tourists will vary where they fall within the dimensions of the model of tourism motivation based on how they optimize their internal conflict of seeking versus escape and personal versus interpersonal.

Klenosky (2002) advanced tourism motivation research with the *push-pull theory*, the most widely used theory for travel motivation research. Numerous studies have used it as a theoretical foundation, but the research focuses on specific and varying push and/or pull factors for the location or the type of traveler (Fodness, 1994). Studies assess travel to specific places (Correia et al., 2007; Hanquin & Lam, 1999; Yousefi & Marzuki, 2015), thrilling adventures, such as rock-climbing, (Albayrak & Caber, 2018; Caber & Albayrak, 2016; Whyte, 2017), or specific demographic groups (Chen & Chen, 2015; Prayag, 2012; Rita et al., 2019). Several studies even researched push factors for space travel (Olya & Han, 2020; Reddy et al., 2012). Although the research using the push-pull theory was valid and reliable, none developed a universal framework for push or pull factors. Several researchers, though, did develop a means to operationalize Iso-Aloha's (1982) theory of tourism motivation to quantify where a tourist falls within the dimensions of the model (Biswas, 2008; Musselman & Winter, in press; Simková & Holzner, 2014; Snepenger et al., 2006; Thanabordeekj & Nipasuwan, 2017). The study aimed to discover a commonality among people willing to fly as point-to-point suborbital space tourists and where they fall within the four dimensions of the model of tourism motivation.

Snepenger et al. (2006) initially researched the four dimensions of Iso-Ahola's theory of tourist motivation to operationalize the theory, and others improved upon their work. Snepenger et al. (2006) conducted scenario-based research using a questionnaire

with items for each of the four dimensions. The questionnaire was provided to undergraduate students in the United States. Snepenger et al.'s (2006) research was a repeated measures design with eight different scenarios in which participants were queried on their motivation. Snepenger et al. (2006) reported that this type of design enhanced generalizability and reliability because motivation was assessed across a broad range of experiences. The questionnaire items were based on previous motivation research, including Iso-Ahola's theoretical articles. Three items were developed for each of the four dimensions. The results showed the items loaded on the four dimensions of Iso-Ahola's theory of tourism motivation.

Snepenger et al. (2006) provided a list of the three items per dimension used in the pre-test described in the previous paragraph; however, they merely mentioned they developed a final survey. They do not provide the items used in the final survey; however, it is apparent they used four items per dimension because the confirmatory factor analysis (CFA) and structural equation model (SEM) diagrams show four items per construct. Biswas (2008) attempted to contact Snepenger to understand this disconnect but was unsuccessful. Nonetheless, the CFA and SEM research provide reliable and valid results as described in the preceding paragraphs. Several researchers address the issue of the unknown items in follow on studies (Biswas, 2008; Musselman & Winter, in press; Simková & Holzner, 2014; Thanabordeekj & Nipasuwan, 2017).

Snepenger et al. (2006) conducted CFA with six competing models to discover if there are truly four dimensions to Iso-Ahola's theory of tourism motivation. Model 1 had a single factor called *motivation*. Models 2 and 3 were two-factor models with seeking and escaping as factors in model 2 and personal and interpersonal as factors in model 3.

Model 4 was a four-factor model representing the four dimensions of the theory of tourist motivation. Model 5 was similar to model 4 but included escape and seeking as second-order factors. Model 6 was similar to 5 but personal and interpersonal were second-order factors. The fit indices for models 1 were weak, and models 2 and 3 were modest. Models 4, 5, and 6 had superior fit, with similar results with model 4 showing slightly better model fit when compared to models 5 and 6. Model 4, the four-factor model representing the four dimensions of the theory of tourist motivation, was chosen as the best model because it is more parsimonious than models 5 and 6. Snepenger et al.'s (2006) research operationalized Iso-Ahola's (1982) theory of tourism motivation with a model to assess the four dimensions that act as push factors for tourism motivation.

Four follow-on studies mimicked Snepenger et al.'s (2006) research using the four dimensions of Iso-Ahola's theory of tourism motivation (Biswas, 2008; Musselman & Winter, in press; Simková & Holzner, 2014; Thanabordeekj & Nipasuwan, 2017). Simkova and Holzner (2014) used the 12-items from Snepenger et al. (2006) as a questionnaire and averaged the responses for each dimension to compare rural and international tourism but did not validate the model. Two studies did validate Snepenger et al.'s (2006) model with Indian and Chinese tourists (Biswas, 2008; Thanabordeekj & Nipasuwan, 2017). Both models validated factor loading on the four dimensions. Biswas (2008) discarded one item related to personal escape and one item related to interpersonal seeking due to loading on two or more factors. However, Thanabordeekj and Nipasuwan (2017) retained all items; the factor pertaining to personal escape discarded by Biswas (2008) had the second-highest factor loading. Both studies were similar in results for variance explained by the four factors at 63% and 65%, respectively. Biswas (2008)

reported a lower reliability alpha for the four factors than Thanabordeekj and Nipasuwan (2017), but both were acceptable. Biswas (2008) explained the low-reliability alpha could be due to the small sample size. Both studies matched Snepenger et al.'s (2006) SEM comparisons. They reported the same results with model 4, the four-factor model representing the four dimensions of Iso-Aloha's (1982) theory of tourist motivation, having the best fit. Thus, three independent studies, conducted on participants from multiple countries, reported a valid and reliable four-factor model based on Iso-Ahola's (1982) theory of tourism motivation.

To further validate Snepenger et al.'s (2006) model of Iso-Ahola's (1982) theory of tourism motivation, Musselman and Winter (in press) conducted a study using the model applied to point-to-point suborbital space travel. Participants were given a point-to-point suborbital space tourism scenario and asked to respond to the 12 items from Snepenger et al. (2006). After analyzing the data, the researchers modified the original 12 items and added one item each for personal seeking, interpersonal seeking, personal escape, and interpersonal escape. Musselman and Winter (in press) conducted a follow-on study with the modified statements. During exploratory factor analysis, one item was dropped from personal seeking, interpersonal seeking, personal escape, and interpersonal escape. The CFA of the modified model with three items for each of the four dimensions demonstrated a good model fit. The current research study used the revised model.

Tourism motivation can conclusively be defined as a group of characteristics that drive an individual to participate in a tourist activity to achieve a goal and satisfy a need (Khuong & Ha, 2014). The study assessed the four dimensions of tourism motivation as specified by Iso-Ahola's (1982) theory of tourism motivation and how they influenced

the willingness to fly as a point-to-point suborbital space tourist; motivation appears to be the driving force for potential participation in suborbital space flight (Y.-W. Chang, 2017; Olya & Han, 2020). Multiple studies report the motivation for space flight is based on adventure, gratification, social connection, the novelty of space flight, and a desire to seek knowledge about space flight (Ao, 2018; Baugh et al., 2018; Y.-W. Chang, 2017; Laing & Frost, 2019; Olya & Han, 2020).

Ao (2018) conducted qualitative research by reviewing Tweets from astronauts. Ao (2018) discovered astronauts desired meaningful human interactions by documenting and sharing their spaceflight experiences with others. Additionally, sightseeing was the most prominent theme of astronauts while in space. Finally, astronauts were motivated by the adventure, prestige, and pride of space travel. Baugh et al. (2018) conducted research to identify variables that predicted a consumers' willingness to fly in an autonomously-controlled, commercial spacecraft. The study participants were from Amazon's ® Mechanical Turk ®. They found fun factor significantly predicted willingness to fly, suggesting those willing to fly seek gratification in space travel.

Y.-W. Chang (2017) researched four aspects of consumer innovativeness, or attraction, to the newness of space travel. To assess the innovativeness of potential space travelers from the main science area of Taiwan, Y.-W. Chang (2017) used the motivated consumer innovativeness (MCI) scale to assess functional, cognitive, hedonic, and social innovativeness. Y.-W. Chang (2017) found social and hedonic innovativeness influences both attitude toward and the novelty of space travel; novelty partly mediated the relationship between social innovativeness and attitude toward space travel and hedonic

innovativeness and attitude toward space travel. Social innovativeness refers to a social need to be different and hedonic innovativeness refers to adventure, gratification, and experience.

Olya and Han (2020) conducted an online survey of United States participants to assess motivation antecedents of space traveler behavior intentions. All five motivation antecedents in the study (adventure, gratification, social motivation, service experience, and information acquisition) significantly influenced behavioral intentions. Adventure, gratification, and social motivation are defined similarly to Ao (2018), Baugh et al. (2018), and Y.-W. Chang (2017). Service experience defines a person's motivation to experience novel or unique travel, and information acquisition means travelers are motivated by seeking knowledge about space travel. Reddy et al. (2012) found similar results reporting that participants from the United Kingdom were motivated for space travel by the uniqueness (novelty) and the fun experience of space travel.

Laing and Frost (2019) conducted qualitative research with four proposed space tourists, and two astronauts who had flown on the International Space Station. Two of the proposed space tourists were from the United States, one was from the United Kingdom, and one was from Gibraltar. One astronaut was from South Africa, and the other was from the United States. Laing and Frost (2019) focused on space travel in general and did not delimit to suborbital flight. They identified nine key motivations: thrill-seeking, excitement, and risk; freedom and escapism; novelty; curiosity; challenging oneself; spirituality; nostalgia; distinction; and pro-social.

Although Laing and Frost (2019) identified a few additional motivations, their research aligns with the previous studies. Thrill-seeking, excitement, and risk are similar to hedonic innovativeness and adventure. Freedom and escapism is described as seeking the freedom of being in space and experiencing weightlessness, which is in line with gratification. Novelty is a predominant motivation throughout all space tourism research. The discussion on curiosity reflects hedonic innovativeness, sightseeing, and ego-centricity. Challenging oneself refers to a sense of achievement or gratification. Spirituality has not been mentioned explicitly in other research. Spirituality is more in line with the sublimity of space travel and less in line with religiosity; they do admit that this requires more research. Nostalgia is defined as seeking space travel to live out a childhood adventure and is similar to service experience. Distinction is similar to social innovativeness and the need to be different. Pro-social motivations are about sharing information about space travel with others, which is similar to social innovativeness, social motivation, and Ao's (2018) discovery that astronauts sought meaningful human interactions by documenting and sharing their spaceflight experiences with others (Laing & Frost, 2019). These six studies describe people's motivation for space flight as adventure, gratification, social connection, novelty, and desire to seek knowledge about space flight.

Willingness to Fly

Understanding the willingness to fly in space is essential because it is primarily a consumer-oriented field and allows for solutions to challenges associated with this consumer-oriented field (Rice et al., 2020; Winter et al., 2017). Willingness is defined as

a voluntary readiness to act (Thefreedictionary, 2020). As it is applied to space tourism in this study, *willingness to fly* is choosing to fly in a point-to-point suborbital space vehicle voluntarily.

Rice et al. (2015) developed the original willingness to fly scale applied to consumers. Rice et al. (2020) revalidated the willingness to fly scale for use by airline passengers. Researchers have used the willingness to fly scale in studies to assess passengers' willingness to fly with a human pilot, remote control pilot and/or autonomous aircraft control (Mehta et al., 2017; Rice et al., 2014; Rice et al., 2019; Rice & Winter, 2015). A modification of the willingness to fly scale was also used to assess passengers' willingness to ride in a driverless vehicle (Anania, Rice, et al., 2018; Rice & Winter, 2019), and patient's willingness to ride in a driverless ambulance (Winter at al., 2018).

As mentioned previously, Rice et al. (2020) validated the willingness to fly scale; each of the studies discussed above assessed the reliability of the willingness to fly scale, as well. These studies provided valid results for using the willingness to fly scale to assess numerous characteristics of those willing to fly. Rice et al. (2019) identified familiarity, fun factor, and happiness as positive predictors of willingness to fly in an autonomous aircraft; willingness to fly went down as participants' wariness of new technology, fear, and age increased. Rice and Winter (2015) demonstrated decreased willingness to fly with an autopilot controlling an aircraft compared to a human pilot. Using a willingness to ride variant of the willingness to fly scale, Rice and Winter (2019) demonstrated the use of five different characteristic scales as mediators between

willingness to ride and gender. Finally, Winter et al.'s (2018) willingness to ride scale was used to assess willingness to ride in a driverless ambulance driven by a human or an autopilot.

Several published studies have explored willingness to fly as a commercial space tourist (Baugh et al., 2018; Hill et al., 2015; Mehta et al., 2015; Winter & Trombley, 2019). All of the studies used the willingness to fly scale for space travel. Hill et al. (2015) and Mehta et al. (2015) researched the country of origin, gender, and commercial space flight. Hill et al. (2015) assessed trust, and Mehta et al. (2015) assessed willingness to fly related to commercial space flight. Both studies found that females from the United States had less trust and were less willing to fly on commercial space flights than females from India. Results were similar for males from both countries. Baugh et al. (2018) identified variables to predict a consumer's willingness to fly on a commercial spacecraft controlled autonomously. The significant model included fun factor, country of residence, and familiarity as predictor variables for willingness to fly. In the last study, Winter and Trombley (2019) identified familiarity, fun factor, wariness of new technology, anger, disgust, happiness, and sadness as significant predictors of a participant's willingness to fly to Mars. The multiple valid uses of the willingness to fly scale explained in this section support the use of the scale to research point-to-point suborbital space tourists' willingness to fly (Rice et al., 2020).

Gaps in the Literature

The study contributed to the body of knowledge of space tourism and expanded the application of the theory of tourism motivation and willingness to fly scale. A predicted increase in point-to-point suborbital space tourism drives a need for increased knowledge of who will fly in order to provide a focus for industry development (Berger, 2019, 2020; Bergin, 2020; Etherington, 2020; Laing & Frost, 2019; Virgin Galactic, 2020b; Wall, 2020; Zhang & Wang, 2020). To date, no studies have researched tourist motivation and willingness to fly as a point-to-point suborbital space tourist. The study filled a knowledge gap by providing space tourism companies with insightful information on potential tourists. Space tourism companies can use this information for marketing, potential investors, training, and flight experience.

Control Variables

Age

For this study, *age* is measured as the number of years a person has been alive. Literature on how age affects space tourism is sparse, and the influence of age on tourism is mixed. Prior research indicates age influences people's tourism motivation as age influences not only tourism, in general, but specifically, influences push factors (S.C. Chen & Shoemaker, 2014; Jönsson & Devonish, 2008; Kara & Mkwizu, 2020; Li et al., 2013; Yousefi & Marzuki, 2015). However, age is not the sole predictor of tourism motivation; age coupled with other demographics, cultural factors, and self-perceived factors to determine tourism motivation (Alén et al., 2016; Kang et al., 2019; Shavanddasht, 2017).

In researching people's choice to participate in a space flight, the probability of choosing a suborbital space flight, in particular, or any space flight, in general, decreases with age (Crouch et al., 2009; Reddy et al., 2012). However, in a study to identify predictors of a consumer's willingness to fly on a commercial spacecraft controlled autonomously, age was not a significant predictor (Baugh et al., 2018). Winter and Trombley (2019) also did not find age as a significant predictor for willingness to travel to and live on Mars.

Research on age and autonomous vehicles is similarly divided. Age is a predictor of flying on an autonomous commercial airliner, with younger people more willing to fly (J. Lee et al., 2019; Rice et al., 2019). However, the results are not conclusive, and the researchers recommended further research on age and willingness to fly. Rice and Winter (2019) found mixed results of age as a predictor of willingness to ride in a driverless car. Anania, Mehta, et al. (2018) found age was not a predictor of willingness to ride in a driverless car. The impact of age varies with regard to motivation and willingness, thus supporting age as a control variable for the study.

Gender

For this study, *gender* is defined as male or female. Multiple studies have assessed the relationship between gender, motivation, and willingness to fly (Baugh et al., 2018; Crouch et al., 2009; Ewert et al., 2013; Hill et al., 2015; Mehta et al., 2015; Reddy et al., 2012; Winter & Trombley, 2019). Ewert et al. (2013) studied the motivations behind individual participation in adventure activities. They found gender differences in activities with men having higher sensation-seeking and self-image motivation than women, and women having more social motivation than men. Crouch et al. (2009)

conducted a study on consumers' choices with reference to various forms of commercial space flight and concluded that males are significantly more likely than females to choose suborbital space flight. This result does not necessarily show males are more motivated or have increased willingness to fly, but males are more likely to choose suborbital space flight when compared to females. In a study on trust in space tourism travel, Hill et al. (2015) found that men are more trusting than females.

Additionally, Reddy et al. (2012) found that females are less interested in space travel when compared to males. Mehta et al. (2015) studied gender's influence on willingness to fly as a space tourist in a spacecraft piloted by a human. The gender of the human pilot was irrelevant. However, females from India were more willing to fly when compared to females from the United States and males from both countries. More importantly, males from the United States were nearly twice as willing to fly when compared to females from the United States. Baugh et al. (2018) did not find gender as a significant predictor of consumers' willingness to fly on a commercial spacecraft controlled autonomously. Winter and Trombley (2019) did not find gender as a significant predictor for willingness to travel to and live on Mars. The countering research results of gender's influence on motivation and willingness support gender as a control variable for the study.

Annual Income

This study defines *annual income* as annual, gross income in United States dollars. Collins et al. (1995) reported 10% of survey participants from the United States and Canada were willing to pay one year's salary for a trip to space; 2.7% were willing to pay three years' salary (the length of the trip was not specified). Guerster et al.'s (2019)

research defined people with a net worth of over $1 million as those able to purchase a suborbital space flight ticket. They found more individuals were willing to purchase a ticket as ticket prices reduced; 16% were willing to buy at $250,000 while only 10% were willing to buy at $500,000. Mehta et al. (2019) found yearly income as a significant predictor of participants' choice of a legacy air carrier when compared to a low-cost air carrier. They hypothesize that participants with higher yearly income can choose to pay for luxury as yearly income increases. Winter and Trombley (2019) did not find income as a significant predictor for willingness to travel to and live on Mars. Although the research associated with income and suborbital space flight is not extensive, enough research supports annual income as a control variable for the study. Table 1 shows the factors and variables.

Table 1

Details of Study Factors and Variables

Factor/Variable	Operational Definition/Description	Type	Number of Items	Sources
Personal Seeking	A tourist pursuing rest and relaxation, ego-enhancement, and/or novelty	Exogenous	3	Iso-Ahola, 1982; Musselman & Winter, in press; Snepenger et al., 2006
Interpersonal Seeking	A tourist pursuing interaction with new people in a tourism group or location	Exogenous	3	Iso-Ahola, 1982; Musselman & Winter, in press; Snepenger et al., 2006
Personal Escape	A tourist evading personal concerns and difficulties	Exogenous	3	Iso-Ahola, 1982; Musselman & Winter, in press; Snepenger et al., 2006
Interpersonal Escape	A tourist evading friend, family, and/or co-workers	Exogenous	3	Iso-Ahola, 1982; Musselman & Winter, in press; Snepenger et al., 2006
Willingness to Fly	A tourist choosing to voluntarily fly in a suborbital space vehicle	Endogenous	3	Rice et al., 2020
Age	Number of years a tourist has been alive	Control	1	Crouch et al., 2009; Reddy et al., 2012; Baugh et al., 2018; Trombley & Winter (2019)
Gender	Male or Female	Control	1	Baugh et al., 2018; Crouch et al., 2009; Hill et al., 2015; Mehta et al., 2015; Reddy et al., 2012; Winter & Trombley, 2019
Annual Income	Annual, gross income in U. S. dollars	Control	1	Collins, et al., 1995; Guerster, et al., 2019; Mehta et al., 2019; Winter & Trombley, 2019

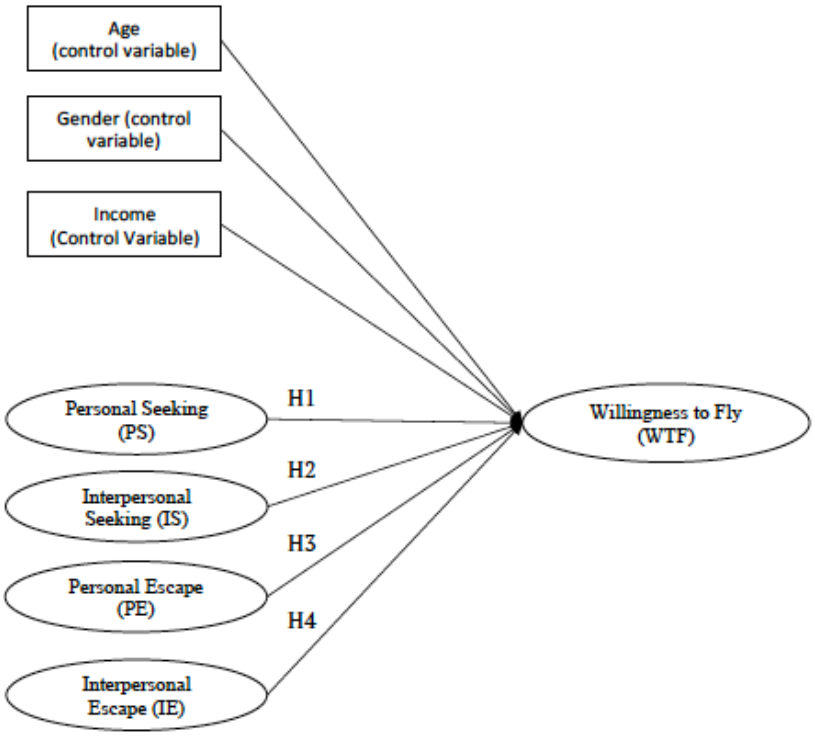
Hypotheses and Support

The literature review provided the theoretical framework shown in Figure 1, which assessed tourism motivation and willingness to fly as a point-to-point suborbital space tourist. The endogenous variable was willingness to fly. Exogenous variables included personal seeking, interpersonal seeking, personal escape, and interpersonal escape. Control variables included age, gender, and annual income (see Table 1).

Figure 1 shows the constructs and theorized relationship of the model. Personal seeking, interpersonal seeking, personal escape, and interpersonal escape are the four dimensions (constructs) of the theory of tourism motivation. Age, gender, and annual income, as control variables, are held constant to control for their potential influence on motivation constructs and willingness to fly (Carlson & Wu, 2012). Personal seeking, interpersonal seeking, personal escape, and interpersonal escape directly influence willingness to fly. This model is theoretical; therefore, additional relationships between factors could exist once the structural equation model is run. Additionally, factors not accounted for in the model could influence tourism motivation and willingness to fly. However, the study was limited in scope to the theory, based on the literature review, supporting the factors present in the model. The remainder of this section discusses the hypotheses derived from the model.

Figure 1

Research Theoretical Framework and Hypotheses



Note. All exogenous variables will be covaried in the data analysis. Covariance lines are not depicted in the figure for clarity. Hypotheses will be tested while controlling for age, gender, and annual income.

***H*$_1$**: There is a significant positive relationship between personal seeking and willingness to fly.

***H*$_2$**: There is a significant positive relationship between interpersonal seeking and willingness to fly.

***H*$_3$**: There is a significant negative relationship between personal escape and willingness to fly.

***H*$_4$**: There is a significant negative relationship between interpersonal escape and willingness to fly.

Previous research demonstrates age influences tourism motivation (S.C. Chen & Shoemaker, 2014; Jönsson & Devonish, 2008; Kara & Mkwizu, 2020; Li et al., 2013; Yousefi & Marzuki, 2015). However, age is not the sole predictor of tourism motivation (Alén et al., 2016; Kang et al., 2019; Shavanddasht, 2017). Willingness to participate in a space flight decreases with age (Crouch et al., 2009; Reddy et al., 2012), but previous willingness to fly research has mixed results regarding age's effect on willingness to fly (Anania, Mehta, et al., 2018; Baugh et al., 2018; J. Lee et al., 2019; Rice & Winter, 2019; Rice et al., 2019). In general, as people's age increases, they are less willing to accept technology (Cruz-Cardenas et al., 2019; Mehta et al., 2016; Rojas-Mendez et al., 2017). Therefore, controlling for age's influence on motivation and willingness was theoretically justified (Becker et al., 2015; Bernerth & Aguinis, 2016).

Gender can influence motivation and willingness. Males tend to be more likely (Crouch et al., 2009), trusting (Hill et al., 2015), and interested (Reddy et al., 2012) to participate in space flight when compared to females. However, despite males from the United States being nearly twice as willing to fly compared to females from the United States, females from India were more willing to fly than males from India and the United States (Mehta et al., 2015). Additionally, Baugh et al. (2018) and Winter and Trombley (2019) reported gender was not a significant predictor of willingness to fly in space. Therefore, controlling for gender's influence on motivation and willingness was theoretically justified (Becker et al., 2015; Bernerth & Aguinis, 2016).

Research shows ticket cost influences willingness to pay for a spaceflight ticket (Collins et al., 1995; Guerster et al., 2019). Mehta et al. (2019) hypothesized that participants with higher yearly income could choose to pay for luxury as their yearly income increases. However, Winter and Trombley (2019) did not find income as a significant predictor of willingness to travel to and live on Mars. Based on the potential influence of annual income on motivation and willingness, controlling for annual income's influence on motivation and willingness was theoretically justified (Becker et al., 2015; Bernerth & Aguinis, 2016).

H_1: *There is a significant positive relationship between personal seeking and willingness to fly*.

Hypotheses 1 tested the influence of personal seeking motivation on willingness to fly. Personal seeking involves a tourist pursuing rest and relaxation, ego-enhancement, and/or novelty. Astronauts and potential space tourists seek adventure, prestige, pride, novelty and fun (Ao, 2018; Baugh et al., 2018; Y.-W. Chang, 2017, Laing & Frost, 2019; Olya & Han, 2020; Reddy et al., 2012). Therefore, a positive relationship between personal seeking and motivation is expected.

H_2: *There is a significant positive relationship between interpersonal seeking and willingness to fly*.

Hypotheses 2 tested the influence of interpersonal seeking motivation on willingness to fly. Interpersonal seeking involves a tourist pursuing interaction with new people in a tourism group or location. Astronauts and potential space tourists desire the

social aspect of experiencing space flight and sharing that experience through human interaction (Ao, 2018; Y.-W. Chang, 2017; Laing & Frost, 2019; Olya & Han, 2020). Therefore, a positive relationship between interpersonal seeking and motivation is expected.

H_3: *There is a significant negative relationship between personal escape and willingness to fly.*

H_4: *There is a significant negative relationship between interpersonal escape and willingness to fly.*

Personal escape is a tourist evading personal concerns and difficulties; interpersonal escape is a tourist evading friends, family, and/or co-workers. No research was discovered supporting astronauts' or potential space tourists' motivation as escaping. The hypotheses justification for hypotheses 1 and 2 summarizes the research on space tourist motivation. To date, no research was discovered supporting escape as a motivation for space tourism; however, in assessing the theory of tourism motivation these two dimensions (personal escape and interpersonal escape) are assessed for influence on willingness to fly. It is hypothesized there is a negative relationship between personal escape or interpersonal escape and willingness to fly as a suborbital point-to-point space tourist.

Summary

Tourist motivation and willingness to fly provide the theoretical foundation to study consumer intent for flight as a suborbital point-to-point space tourist. Iso-Ahola's (1982) theory of tourism motivation served as the theoretical framework for tourism motivation. The dimensions of the theory of tourism motivation were assessed with

Snepenger et al.'s (2006) model. Willingness to fly as a point-to-point suborbital space tourist was assessed with the willingness to fly scale (Rice et al., 2020). Age, gender, and annual income are included in the study as control variables.

Understanding tourism motivation for and willingness to fly as a point-to-point suborbital space tourist provides insights into who will choose to purchase a point-to-point suborbital space flight. Future space tourism research will benefit from validating the theory of tourism motivation and willingness to fly scales as they apply to point-to-point suborbital space tourism. To date, no studies have researched tourist motivation and willingness to fly as a point-to-point suborbital space tourist. The study filled a gap in the literature by focusing on tourist motivation and willingness to fly in a point-to-point suborbital space vehicle providing space tourism companies insightful information on potential tourists.

Chapter III: Methodology

Chapter III describes the research method and design followed by the research procedures. The procedures include identifying the sampling frame and sample size, data collection process, ethical considerations to include institutional review board approval, execution of a pilot study, and data collection. The chapter concludes with a description of data analysis via confirmatory factor analysis and structural equation modeling. This chapter intends to provide sufficient detail for the near-replication of the study and transparent and open guidelines for obtaining the results.

Research Method and Design

The study used a quantitative methodology and non-experimental, cross-sectional study design to assess the influence of tourism motivation on willingness to fly as a point-to-point suborbital space tourist. The quantitative method was executed with structural equation modeling (SEM) for data analysis. The survey instrument assessed the theoretical perspectives of tourism motivation and willingness as they apply to the hypotheses. As opposed to qualitative methods, a quantitative methodology is particularly useful in measuring theory in this manner (Creswell, 2014; Yilmaz, 2014).

The variables within this study were not manipulated, causation was not concluded, and the study did not randomly assign the participants. Therefore, the research is non-experimental (Vogt et al., 2012). The study is cross-sectional because it measured a sample at a static point in time as opposed to a longitudinal measurement, which would measure the sample over some specified time frame (Creswell, 2014).

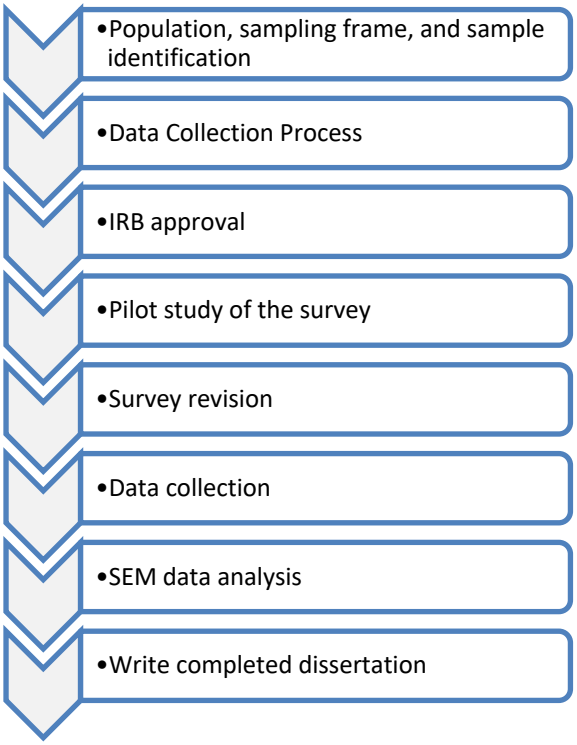
A survey design was best for the study because the data was obtained directly from individuals within the population of interest, brief answers to structured questions obtained the data, the respondents were expected to give reliable information, the research questions were operationalized, and an adequate response rate was achieved (Vogt et al., 2012). Previous research provided the survey questions for the study as this increased reliability and saved time (Vogt et al., 2014). Surveys are useful in assessing behavioral intentions and generalizing from a sample to a population to make inferences about the behavioral intentions (Wiggins et al., 1999). The survey method also allows other researchers to replicate the research, thus expanding the body of knowledge beyond the current study.

Research Procedures

The study was executed in a sequential process with multiple steps, as depicted in Figure 2. The process began with defining the population, sampling frame, and sample based on the survey instrument developed. The data collection process was outlined before seeking approval from Embry-Riddle Aeronautical University's Institutional Review Board (IRB) in the third step. Next, a pilot study of the survey was developed. The survey was revised, as required, before proceeding to complete data collection. Finally, the data collected was analyzed via structural equation modeling, and the hypotheses were evaluated as part of the complete writing of the dissertation.

Figure 2

Research Study Process



Population/Sample

Population and Sampling Frame

The target population is the group of individuals to whom the researcher seeks to generalize the results, while a sampling frame is the portion of this group of individuals accessible for research. The sample is the actual individuals studied in the research project (Creswell, 2014; Vogt et al., 2014). The desired outcome is to generalize the results obtained from a sample to the target population (Mehta et al., 2019).

The study intended to measure the tourism motivation and the willingness to fly of suborbital point-to-point space tourists in the United States. Suborbital point-to-point space tourism will be available to the general public; therefore, the target population is

United States residents 18 years of age or older. This target population was selected because members of the United States are the most likely initial suborbital space tourism participants when compared to other countries (LeGoff & Moreau, 2013; The Tauri Group, 2014), and the United States has an emerging suborbital space tourism industry (Berrisford, 2018; E. Chang, 2020; Gray, 2020; Sheetz, 2020). The United States' space industry is developing suborbital point-to-point space flight and speculates viable flight by 2030 (Berger, 2019, 2020; Bergin, 2020; Etherington, 2020; Wall, 2020).

It is not practical and would require excessive time to research the entire target population; therefore, the study accessed a sample of the population. The sampling frame was English-speaking United States residents 18 years of age or older with a computer, internet access, and Amazon's ® Mechanical Turk ® accounts. While physical access may ensure more of the population is accessed locally, it is impractical to reach the breadth of the United States population without electronic means. Direct sampling would limit the study, and Amazon's ® Mechanical Turk ® provided an opportunity to access a broad sampling of the United States population while still providing high-quality data, which is, at a minimum, equal to a conventional laboratory setting. Additionally, easy access to a broad sample allowed for increased generalizability with improved external validity (Buhrmester et al., 2011; Chandler et al., 2019; Germine et al., 2012; Rice et el., 2017). Therefore, the sampling frame was individuals available to complete the survey on Amazon's ® Mechanical Turk ® when posted.

Sampling Strategy

A convenience sample from Amazon's ® Mechanical Turk ® was used. Vogt et al. (2012) argue that convenience sampling should seldom be used. However, other research supports the use of Amazon's ® Mechanical Turk ® as a sample source. Amazon's ® Mechanical Turk ® provides stable access to a pool of participants, and the participants are diverse across education, demographic, and dispositional variables (Mason & Suri, 2012; Mehta et al., 2019; Sheehan, 2018). Amazon's ® Mechanical Turk ® was selected as the means to recruit and access the sample in the study because it provided the ability to acquire many samples expeditiously with results similar to laboratory or offline studies (Buhrmester et al., 2011; Germine et al., 2012; Mason & Suri, 2012; Ramsey et al., 2016). Additionally, Walter (2019) reported equal internal and external validity when comparing online survey platforms to other forms of convenience samples within the field of applied psychology. Finally, Amazon's ® Mechanical Turk ® provided access to a broad population providing the opportunity to increase generalizability with increased external validity (Rice et al., 2017).

Sample Size

Determining the sample size is complex for structural equation modeling, and the required sample size is larger than for other multivariate techniques (Crocket, 2012; Hair et al., 2018). Generally, a larger sample size is better (Vogt et al., 2012), but there are various perspectives on the optimum sample size for structural equation modeling. Previous research reports the optimum sample size to be between 5 to 20 participants per variable. The discussion goes further into whether this number of participants should be

based on indicator variables, latent variables, or both. Moreover, others report that the sample size should be based on a no less than a number somewhere between 200 to 300 participants (Crocket, 2012; Hair et al., 2018; Westland, 2010).

Additionally, a higher factor loading is required with a smaller sample size; thus, a larger sample size is more beneficial (Dragan & Topolsel, 2014). The optimum sample size is influenced by multivariate normality, estimation technique, model complexity, missing data, and average error variance of the indicators (Hair et al., 2018; Westland, 2010). This disparity and complexity led Westland (2010) to develop an equation to calculate the minimum sample size for structural equation modeling and conducted a meta-analysis of 74 articles comparing the equation to the reported sample sizes. Westland (2010) reported that 80% of the studies had too low a sample size for the study conclusion, and an equation to calculate the minimum sample size, illustrated in Equation 1, was developed.

$$n = \frac{1}{2H}\left(A\left(\frac{\pi}{6} - B + D\right) + H + \sqrt{\left[A\left(\frac{\pi}{6} - B + D\right) + H\right]^2 + 4AH\left(\frac{\pi}{6} + \sqrt{A} + 2B - C - 2D\right)}\right) \quad (1)$$

Where:

$A = 1 - \rho^2$

$B = \rho \arcsin\left(\frac{\rho}{2}\right)$

$C = \rho \arcsin(\rho)$

$D = \frac{A}{\sqrt{3 - A}}$

$H = \left(\frac{\delta}{z_{1-\alpha/2} - z_{1-\beta}}\right)^2$

Westland's (2010) study is the basis for an online calculator used to discover the lower bound of sample size for structural equation modeling research (Soper, 2020). The calculator has demonstrated precedence in dissertations using structural equation modeling for data analysis (Fussell, 2020; Myers, 2019; Techau, 2018; Pan, 2017). When calculating the sample size requirement for a structural equation model using the online sample size calculator by Soper (2020), the following input parameters are required: effect size ($f2$), probability level (α), statistical power level (1-β), the number of latent variables, and the number of observed variables.

The effect size ($f2$) is the magnitude and strength of results from a study (Durlak, 2009). The effect size provides a means to compare statistical results across different analysis methods and units of measure (D. K. Lee, 2016). Soper (2020) reports small, medium, and large effect sizes as 0.10, 0.30, and 0.50, respectively.

The probability level (α) measures the accuracy of the expected result of a statistic. Under the null hypothesis condition, if the probability of observing the difference between the calculated statistic and the expected result is less than or equal to α, then the statistic is most likely not compatible with the null hypothesis condition, and the null hypothesis is rejected. Rejecting a null hypothesis, which is true, or a false positive is defined as a Type-I error. Committing a Type-I error is more substantial than committing a Type-II error. An example of a Type-I error is finding an innocent person guilty. The probability level (α) is also referred to as the significance level and is conventionally accepted to be 0.05 (Liu, 2013; Soper, 2020).

The probability of failing to reject the null hypothesis when it is false is defined as a Type-II error, referred to as β. An example of a Type-II error is finding a guilty person innocent. The statistical power is defined as 1- β. The statistical power represents the probability of rejecting a false null hypothesis when it is indeed false. The statistical power (1- β) is conventionally accepted to be greater than or equal to 0.80 (Liu, 2013; Soper, 2020).

The a-priori online calculator by Soper (2020) was used to calculate the sample size requirement for this study. The following input parameters were specified in the calculator: effect size ($f2$) was set to 0.15, probability level (α) was set at 0.05, while the statistical power level (1-β) was set at 0.9. The number of latent variables was set at 5, while the number of observed variables was set at 22. The calculation resulted in a minimum sample size requirement of 870 participants; however, the sample size was rounded up and an attempt was made to recruit 900 participants.

Data Collection Process

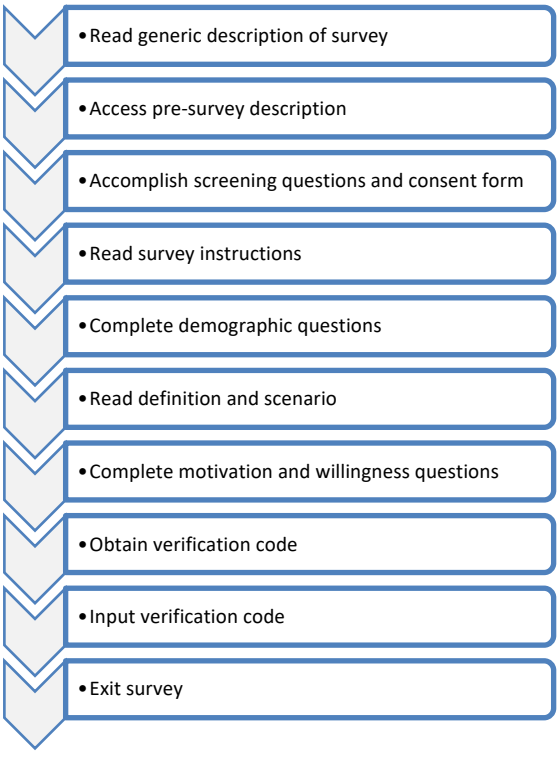
Design and Procedures

A survey was administered to participants and followed a standardized process as provided in Figure 3. In the first step, workers on Amazon ® Mechanical Turk ® were able to view the generic description of the survey. If a participant chose to accept the survey, they were transferred to the survey hosted on Google Forms ® and formally entered the pre-survey stage. At this stage, they acknowledged informed consent and verified they were 18 years or older. Next, the participant was provided with short instructions for survey completion. The survey began by asking the survey participant their age, gender, annual income, country of residence, and ethnicity. After completing

this demographic information, the participant then saw a definition of space tourism before the participant was provided a scenario describing a point-to-point suborbital space flight. The participant was then requested to respond to each survey question with their level of disagreement or agreement. The level of disagreement to agreement was a Likert scale. A Likert scale is useful for measuring the amount of agreement with an attitude or practice, which makes it useful for the study (Vogt et al., 2012). When the participant reached the end of the survey, they were provided a verification code, which they submitted on Amazon ® Mechanical Turk ®. Payment was provided to the participant upon proper input of the code. The survey remained open on Amazon ® Mechanical Turk ® until the appropriate number of participants responded to the survey. A copy of the instrument can be found in Appendix B.

Figure 3

Respondent Survey Process



Apparatus and Materials

Amazon ® Mechanical Turk ® is an online platform where workers accomplish tasks, which require human intelligence. The task is referred to as a human intelligence task (HIT). A task is placed on the online platform by a requester. When a worker completes a HIT, the worker is provided monetary compensation. The requester can host the actual task on an external system (MTurk, 2020). The survey instrument for the study was hosted on Google Forms ®. The requester can provide instructions for the HIT and restrict HIT completion to a specific nationality (MTurk, 2020). This feature allows only workers registered in the United States to complete the HIT. Applying this feature did not appreciably restrict access to potential participants as nearly 80% of workers are from the United States (Sheehan, 2018).

Because structural equation modeling is sensitive to missing data (Hair et al., 2018), recruiting participants who will fully complete the survey is beneficial. A requester can approve or reject a worker's HIT based on the completeness of the HIT; the worker maintains an approval rating based on the number of approved HITs. Additionally, a requester can recruit only participants with a high approval rating (Rice et al., 2017). Workers with a higher approval rating produce higher quality work. It has also been demonstrated that workers who have completed more than 100 HITs produce higher quality data (Peer et al., 2014). Therefore, only workers with a greater than 98% approval rating who have completed greater than 100 HITs were accepted to complete the survey.

The participants were compensated $0.50. This compensation is in line with previous research. Sheehan (2018) recommends paying $0.15 per minute of work to receive good quality responses, and the median hourly wage for workers is reported as approximately $2.00 per hour (Hara, 2018).

Sources of the Data

An online survey was the measurement instrument for the study. The measurement items were based on measurement items from previous studies with slight adjustments to accommodate the context of this study. The measurement item sources are listed in Table 1. The proposed survey is located in Appendix B.

When collecting data from Amazon's ® Mechanical Turk ®, several methods were employed to ensure the quality of the collected data and the sample's validity. Attention checks provide a means to validate the participants' attention or focus on the content of the questions; inattentiveness is an indicator of low data quality. Workers on Amazon's ® Mechanical Turk ® consistently perform better on attention checks than participants from subject pools of university students; however, it is still prudent to perform attention checks (Hauser, 2016). A simple, easily answered question appeared within the proposed survey. A proper answer indicated the participant was paying attention to the question content (Kees et al., 2017; Sheehan, 2018; Silber et al., 2019).

To improve data quality, research also suggests the use of time thresholds for the amount of time it takes to complete the survey and evaluation of response patterns (i.e., participant answers strongly disagree for all survey items) (Connors et al., 2020; Gaskin, 2017; Stritch et al., 2017; Wood et al., 2017). An unengaged respondent was assessed

with lower time constraints to determine if they completed the survey too quickly. If the data for the participant appears to be unengaged, the participant was considered for removal.

Decreasing sampling bias can also increase data quality and is an important consideration for internet-based surveys like Amazon ® Mechanical Turk ®. Sampling bias can be decreased with a generic description of the survey to ensure potential participants can assess the nature of the survey without the survey being more or less attractive to respondents of a certain demographic or characteristic (Goodman & Paolacci, 2017). As such, the survey participants only saw a generic description of the survey displayed in Amazon ® Mechanical Turk ® before choosing to participate in the survey.

Ethical Consideration

Informed Consent

Informed consent provides a participant the opportunity to willingly participate in survey research after the researcher thoroughly explains the purpose and risks of the research (Babbie, 2020; Vogt et al., 2012). To thoroughly execute informed consent, the researcher should identify themselves and any sponsoring institutions, list benefits and risks to the participant, guarantee anonymity and confidentiality, explain eligibility and exclusion criteria, and clearly communicate that the survey is voluntary (Creswell, 2014).

The IRB serves the purpose of validating the researcher is effectively meeting informed consent requirements. When administering the survey, it is the researcher's responsibility to effectively communicate informed consent via some version of an

informed consent form. Additionally, the researcher provides a means for the participant to deliberately and voluntarily agree to the informed consent or withdraw from the survey.

Anonymity and Confidentiality

Anonymity and confidentiality protect study participants' interests and identity. Anonymity is provided when neither the researcher nor people who read the associated manuscripts can associate a specific response with a specific participant. Anonymity can increase the likeliness a participant will respond and the accuracy of their response. Confidentiality, which is sometimes confused with anonymity, is provided when the researcher can connect a participant with their responses but guarantees they will not reveal their identity or responses (Babbie, 2020). The study ensured anonymity. To ensure anonymity, only age, country of residence, ethnicity, annual income, and gender were collected, but more importantly, based on the research procedure and design, the researcher did not have the ability to identify any participant; thus, confidentially was maintained.

Analysis and Reporting

With respect to analysis and reporting, the researcher has an obligation to participants to use fair and accurate research methods. Fair and accurate analysis and reporting reduce the chance of stereotyping, thus ensuring no harm. Researchers should also report descriptive statistics and ensure the reliability and validity of the results. Additionally, the researcher should accurately report the data analysis even if it identifies research procedure and design deficiencies or undesirable results. A researcher has an obligation to maintain privacy through anonymity and confidentiality, and has an ethical

obligation to make data available to other researchers. When providing research results to other researchers, the researcher should maintain privacy, whether by data perturbations or some other means (Vogt et al., 2012). The study made every effort to follow these ethical reporting and analysis guidelines.

Institutional Review Board

The Institutional Review Board (IRB) was created as a result of the Belmont Report and codified in federal regulations managed by the Office of Human Research Protections in the Department of Health and Human Services (Spellecy & Busse, 2021). The purpose of the IRB is "to protect human research participants from possible harms that could result from the research" (Vogt et al., 2014, p. 342). The IRB accomplishes this with the use of seven criteria for research approval: informed consent is sought where applicable, informed consent is documented where applicable, appropriate privacy and confidentiality measures are in place, risks are minimized, risks are reasonable when balanced against benefits, ensure the safety of the participant during data collection when appropriate, and participant selection is equitable (Spellecy & Busse, 2021).

Embry-Riddle Aeronautical University requires researchers who plan to conduct research with human participants, contributing to generalizable knowledge, to submit an application to the IRB before starting research. The study included a survey of human participants and sought to contribute to generalizable knowledge through publication; therefore, the IRB application in Appendix A was submitted to the Embry-Riddle Aeronautical University (ERAU) IRB (ERAU, 2021). No data collection occurred until IRB approval was received.

Measurement Instrument

The measurement instrument is an online survey. The survey is composed of items, which load on different latent variables. All variables and items are sourced from previous research with minor modifications, where needed, to reflect the context of the study. The complete survey is shown in Appendix B. Table 1 provides the sources of the items and details about each variable.

Section one of the survey begins with the consent form. The form provides a short description of the purpose followed by eligibility to complete the study; to be eligible, the worker must be a resident of the United States and at least 18 years old. Following the eligibility verification is a description of risk, benefits, confidentiality, and the amount of compensation for completing the survey. Contact information for the investigator was provided, and the worker was informed that the survey was voluntary. The workers could discontinue the survey at any time before completion, and their responses would not be recorded. The workers were asked to check a radio button for 'Yes' to certify they are residents of the United States, at least 18 years of age, understand the information on the consent form, and voluntarily agree to participate in the study. If the workers did not wish to participate in the study, they could close the browser or check the 'No' radio button.

The second section of the survey included instructions that informed the workers they would be asked some questions about themselves. These initial questions asked the participants' age, gender, annual income, country of residence, and ethnicity. Additionally, the instructions indicated that the survey would take about 10 minutes to complete.

The third section began with a definition of space tourism followed by a point-to-point suborbital space tourism flight scenario. A map depicting the flight path was included. The following is the scenario presented to the worker: "*You will receive one day of pre-launch training the day before your flight. On the day of launch from Spaceport America in Las Cruces, NM, you will board the suborbital space vehicle. Your suborbital space flight travels around the globe flying over the midwestern United States and past the Great Lakes. The flight proceeds over southern Greenland, Ireland, England, France, Italy, Greece, Israel, Jordan, and Saudi Arabia. The flight proceeds between Antarctica and Australia and over the South Pacific before landing back at Spaceport America. This flight is provided to you free of charge (the flight does not cost you any money).*" Following the scenario, the participants were asked their level of disagreement or agreement to some statements associated with tourism motivation and willingness to fly.

The last section began with a short statement thanking the participant for participating in the survey. The participants were instructed to create a verification code, which they would enter into Amazon ® Mechanical Turk ® for compensation. Finally, the participant clicked the submit button to complete the survey.

Pilot Study

A pilot study can be completed before the main study using fewer individuals than the main study (In, 2017)to assess the feasibility of the research design or test the research instrument for effectiveness and transferability from previous use to use in the

current study. With the pilot study, the researcher can identify problems in the research design, protocols, and/or the measurement instrument (Malmqvist et al., 2019; Van Teijlingen & Hundley, 2002).

Two pilot studies were conducted for this research. A sample size of 100 for the first study and 94 for the second study were collected from Amazon ® Mechanical Turk ®. The sampling frame was the same as the main study (In, 2017). The research design and procedures were also the same as the main study with one modification. In the pilot study, participants were able to provide feedback, via written comments, on the various sections of the measurement instrument. The desired outcome was for participants to identify confusion with the layout and sequencing of the measurement instrument, ambiguous or incomprehensible wording of the instructions, scenario and statements, and the time required to complete the measurement instrument.

The results of pilot study results were used to modify several questions before conducting pilot study two, which was able to assess the proposed research design, protocols, and the measurement instrument before executing the main study. Adjustments made, based on the results of the pilot study, are reported in Chapter 4. Participants from the pilot study were excluded from participating in the main study through the use of a user-defined parameter on Amazon ® Mechanical Turk ®. Finally, data from the pilot study was not used in the main study.

Variables and Scales

The study has one endogenous latent factor (dependent variable) and four exogenous latent factors (independent variables). Age, gender, and annual income are control variables. Age and annual income are continuous variables. Gender is a

categorical variable. Age, gender, and annual income are directly observed variables; as control variables, they are not influenced by or do not influence other variables in the model. The remaining variables, as scales, are latent constructs, assessed as several observed variables. The number of observed variables for each factor (latent construct) varies between three and seven and is listed in Table 2. Hair et al. (2018) recommend at least three observed variables for each latent construct within a congeneric structural equation model.

The observed variables for latent factors were assessed using a Likert response format. All scales used a 5-point Likert response format ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 2

Study Latent Factors/Variables and Observed Variables

Factor/Variable	Type	Observed Variables
Personal Seeking (PS)	Exogenous	PS1, PS2, PS3
Interpersonal Seeking (IS)	Exogenous	IS1, IS2, IS3
Personal Escape (PE)	Exogenous	PE1, PE2, PE3
Interpersonal Escape (IE)	Exogenous	IE1, IE2, IE3
Willingness to Fly (WTF)	Endogenous	WTF1, WTF2, WTF3, WTF4, WTF5, WTF6, WTF7
Age	Control	Number of years alive
Gender	Control	Male or Female
Annual Income	Control	Annual, gross income in U. S. dollars

Tourism motivation scale. The tourism motivation scale was originally developed by Snepenger et al. (2006) to operationalize Iso-Ahola's (1982) theory of tourism motivation. Snepenger et al.'s (2006) research resulted in a four-factor model,

and each factor was assessed using three items. Confirmatory factor analysis reported a good model fit with a GFI of .954, CFI of .98, and RMSEA of .49. Cronbach's Alpha was above .80 for all factors with .86 for personal escape, .85 for interpersonal escape, .85 for personal seeking, and .80 for interpersonal seeking.

Musselman and Winter (in press) validated the four-factor model with three items per factor for use with point-to-point commercial space flight (Figure 4). The validation resulted in the items being worded differently than the original items in Snepenger et al.'s (2006) model. Confirmatory factor analysis reported a good model fit as listed in Table 3. The convergent validity, which is assessed as average variance extracted (AVE), was greater than .575 for all four factors and is recommended to be greater than or equal to .50 (Hair et al., 2018). The construct reliability (CR) was greater than .799 for all four factors and is recommended to be greater than or equal to .70 (Hair et al., 2018). The discriminant validity, which is assessed as AVE greater than maximum shared variance (MSV), was acceptable, as reported in Table 4.

Table 3

Tourism Motivation Scale Goodness of Fit Indices

Indices	Value	Recommended value	Reference
Comparative Fit Index (CFI)	.975	≥0.95	Byrne, 2016; Hair et al., 2018
Goodness of Fit Index (GFI)	.962	≥0.90	Byrne, 2016; Hair et al., 2018
Adjusted Goodness of Fit Index (AGFI)	.936	≥0.90	Byrne, 2016; Hair et al., 2018
Normed Fit Index (NFI)	.960	≥0.90	Byrne, 2016; Hair et al., 2018
Root Mean Square Error of Approximation (RMSEA)	.055	≤0.06	Byrne, 2016; Hair et al., 2018
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	2.54	$1< \chi 2/df<3$	Byrne, 2016; Hair et al., 2018

Note. Adapted from "Validation of an operationalized model of Iso-Ahola's theory of tourism motivation: A case in point-to-point suborbital space travel," by B. T. Musselman and S. R. Winter, in press, Journal of Aviation/Aerospace Education and Research.

Table 4

Tourism Motivation Scale Validity and Reliability

Factor	CR	AVE	MSV	Reference
Personal escape (PE)	.799	.575	.413	Byrne, 2016; Hair et al., 2018
Interpersonal escape (IE)	.835	.629	.413	Byrne, 2016; Hair et al., 2018
Personal seeking (PS)	.814	.615	.308	Byrne, 2016; Hair et al., 2018
Interpersonal seeking (IS)	.812	.591	.166	Byrne, 2016; Hair et al., 2018

Note. Adapted from "Validation of an operationalized model of Iso-Ahola's theory of tourism motivation: A case in point-to-point suborbital space travel," by B. T. Musselman and S. R. Winter, in press, Journal of Aviation/Aerospace Education and Research.

Willingness to fly. Willingness to fly in commercial air travel has been assessed in numerous situations and associated with various human aspects (Mehta et al., 2017; Rice & Winter, 2015; Winter et al., 2015). Rice et al. (2020) developed a valid willingness to fly scale with seven items loading onto the willingness to fly scale. Factor

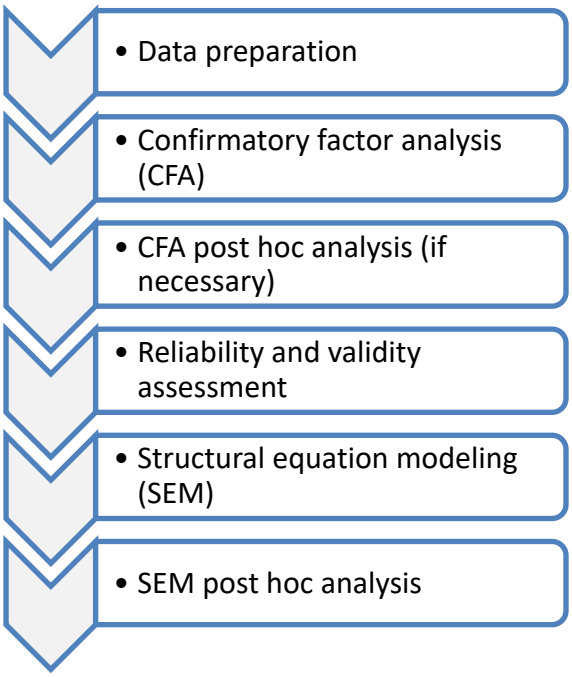
analysis showed all items loaded on the single factor of willingness to fly with 87.22% and 89.35% of the variance explained by the scale in the two scenarios analyzed. A Cronbach's Alpha test resulted in .975 and .980 for the two scenarios analyzed, indicating extremely high consistency between items. Finally, Guttmann's Split Half test resulted in a value of .949 and .963 for the two scenarios analyzed, indicating extremely high reliability.

Data Analysis Approach

The data analysis was conducted upon completion of the data collection. Broadly, the data analysis process included data exploration and description, confirmatory factor analysis (CFA), and structural equation modeling (SEM). More specifically, the data analysis process involved the steps listed in Figure 4. The specifics of each step are discussed in this section.

Figure 4

Data Analysis Process



Data Preparation

The data collected via a survey was prepared to execute the analysis effectively. The first step in data preparation was to identify and handle missing data with either deletion or imputation. Next, unengaged responses were assessed through validation of attention checks, time thresholds, and nearly the same response for every item by one individual. Univariate outliers of the continuous variables, age and annual income, were evaluated using a boxplot. The final step in data preparation was the assessment of normality of data via skewness and kurtosis (Gaskin, 2017; Hair et al., 2018).

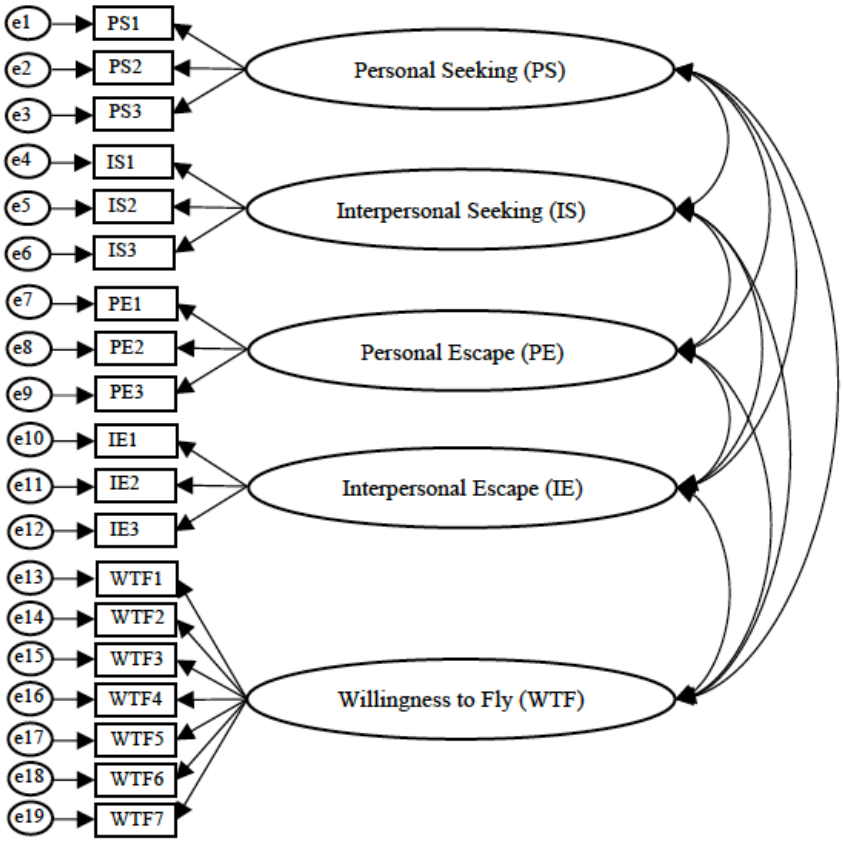
Confirmatory Factor Analysis

CFA was the next step in the data analysis process. The purpose of CFA was to test how well real data collected from the measurement instrument fits the theorized measurement model composed of the latent variables measured by observed variables (Hair et al., 2018). CFA is appropriate when the researcher, based on theory, has an understanding of the latent variable structure (Byrne, 2016). In CFA, the latent variable is said to cause the observed variables, and this cause is measured via the covariance of the observed variables and the latent variable (Kline, 2016).

A CFA model, with the factors described in the literature, was developed. The proposed CFA model included five latent factors: PS (personal seeking), IS (interpersonal seeking), PE (personal escape), IE (interpersonal escape), and WTF (willingness to fly). The original CFA model is shown in Figure 5.

Figure 5

Proposed CFA Model



The CFA was designed and computed using SPSS AMOS ®. Goodness of fit (GOF) indices were used to assess the CFA model results. The GOFs indices used in the study and their recommended values are listed in Table 5. Any GOF representing less than adequate model fit resulted in post hoc analysis.

Table 5

Recommended Values for Goodness of Fit Indices

Indices	Recommended Value	Reference
Comparative Fit Index (CFI)	≥0.95	Byrne, 2016; Hair et al., 2018
Goodness of Fit Index (GFI)	≥0.90	Byrne, 2016; Hair et al., 2018
Adjusted Goodness of Fit Index (AGFI)	≥0.90	Byrne, 2016; Hair et al., 2018
Normed Fit Index (NFI)	≥0.90	Byrne, 2016; Hair et al., 2018
Root Mean Square Error of Approximation (RMSEA)	≤0.06	Byrne, 2016; Hair et al., 2018
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	$1< \chi 2/df<3$	Byrne, 2016; Hair et al., 2018

Where necessary, post hoc analysis was used to consider the respecification and re-estimation of the model. Modification indices were examined to determine potential model respecification. The two modification indices examined were covariance of error and cross-loading of factors. Covariance of error represents overlap in the content of items, whereas cross-loading of factors indicates an observed variable loading on two or more latent variables. If supported by the theory of the study, the modification indices with the highest value were respecified (deleting, adding covariance between error terms, or loading an observed variable on a latent variable). Only one respecification was applied at a time. After each respecification, the GOF indices for the CFA model were computed and assessed until adequate model fit was achieved. The reliability and validity of the final CFA model were calculated to ensure satisfactory results (Byrne, 2016; Hair et al., 2018; Kline, 2016).

Reliability Assessment Method

Reliability measures the extent to which the multiple observed variables converge on a single latent variable. The Construct Reliability (CR) and Cronbach's alpha for each latent variable in the model were assessed. CR was measured as the quotient of the square

of the sum of the standardized factor loadings of the multiple observed variables on the single latent variable, and this resultant value plus the sum of the error variance of the multiple observed variables on the single latent variable. CR was calculated via Equation 2:

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + (\sum \epsilon_i)} \quad (2)$$

Where:

λ = the standardized factor loading for item i.

Ɛ = the error for item i.

Standardized factor loadings (regression weights) and error variance reported by SPSS AMOS ® were used to calculate CR values for each latent variable. A CR value of 0.70 or higher indicated acceptable internal consistency (Byrne, 2016; Dragan & Topolsek, 2014; Hair et al., 2018).

Cronbach's Alpha, along with CR, is a measurement of reliability. Although CR is commonly used for structural equation modeling, Cronbach's Alpha is a more broadly used measure of reliability. Cronbach's Alpha measures the degree to which responses to observed variables are consistent for a latent variable. These two reliability estimates usually do not provide drastically different results, but it is common to report both. Cronbach's Alpha was calculated via SPSS Statistics ®. Cronbach's Alpha values greater than or equal to 0.70 are acceptable; the higher the value (toward 1.0), the higher the measured reliability (Hair et al., 2018; Kline, 2016; Vogt et al., 2014).

Validity Assessment Method

Convergent and discriminant validity were assessed. Convergent validity assesses the variance in common of observed variables of a specific latent variable. For acceptable convergent validity, the observed variables should share a high amount of variance, or the observed variables should converge on the specific latent variable. The average variance extracted (AVE) was used to assess convergent validity. AVE is the quotient of the total of the squared standardized factor loadings for all observed variables and the number of observed variables. Convergent validity less than 0.50 represents more error in the observed variables than the variance in common with the latent variable. An AVE above 0.50 is adequate (Dragan & Topolsek, 2014; Hair et al., 2018; Kline, 2016).

Discriminant validity assesses whether observed variables for a latent variable do not highly correlate with other latent variables. Maximum shared variance (MSV) is calculated as the squared correlation between two latent variables. Adequate discriminant validity exists when the AVE of each of two latent variables is greater than the MSV.

Structural Equation Modeling

Structural equation modeling (SEM) combines a measurement model and a structural model. The measurement model evaluates how observed variables combine to represent latent variables. The structural model shows relationships between latent variables (Hair et al., 2018). The measurement model functions as a CFA, and the structural model is depicted in Figure 1. SEM is the final step in data analysis, which, thus far, has included data preparation, confirmatory factor analysis, reliability

assessment, and validity assessment. The structural equation model provides the means to assess the hypotheses specified as a relationship in the model. Figure 1 depicts the original SEM for the study.

SEM testing used a process similar to CFA and was designed and analyzed using SPSS ® AMOS 27. The same GOF indices (Table 5) were used, and the post hoc analysis was executed as required. In addition to the above evaluation of GOF indices, individual parameter estimates for the four hypotheses specified in the study were evaluated for statistical and practical significance.

Summary

The chapter discussed the research methodology used to execute the research and analysis. A quantitative methodology and non-experimental, cross-sectional study design was used. The sampling frame is English-speaking United States residents 18 years of age or older with a computer, internet access, and an Amazon ® Mechanical Turk ® account. The sample size was 870 participants. The study complied with appropriate ethical considerations and institutional review board standards. Two pilot studies were conducted to assess the feasibility of the research design and to test the research instrument for effectiveness and transferability from previous use to use in the current study. Following modifications from the pilot study, the full study was executed. Statistical analysis was accomplished using structural equation modeling. This chapter provides the segue to the results and analysis of the study.

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Chapter IV: Results

The study assessed the influence of the four dimensions of Iso-Ahola's (1982) theory of tourism motivation on willingness to fly as a point-to-point suborbital space tourist. First, the results and analysis from two pilot studies are discussed. Next, the main data collection is presented along with demographic and descriptive statistics, followed by a reliability and validity assessment. Finally, the chapter concludes with running the full-scale structural equation model with a discussion of the hypotheses testing results.

Pilot Studies

Two pilot studies were accomplished before the main study. The first pilot study presented some disconnects in survey instrument formatting. Modifications were made to the survey instrument before completing the second pilot study.

Pilot Study 1

A sample from Amazon ® Mechanical Turk ® was used for the first pilot study. There were 100 responses. During data preparation, it was discovered that one statement for each of the four latent variables for tourism motivation was transposed incorrectly from Musselman and Winter (in press). Additionally, 14 responses to the question "What is you annual, gross income (in U.S. dollars)?" were blank or unusable. The word 'you' should also have been the word 'your.' Finally, one worker identified the instructions in Amazon ® Mechanical Turk ® described the survey instrument as taking 5 minutes while the instructions on the actual survey stated the survey would take 10 minutes.

The four incorrect statements were corrected on the survey instrument. The annual income question was adjusted to read as "In U.S. dollars, please report your annual, gross income. For example, $25,000." Lastly, the time to complete the survey

was corrected to 10 minutes on Amazon ® Mechanical Turk instructions. The modified survey instrument was submitted to the Institutional Review Board (IRB) for approval before accomplishing Pilot Study 2.

Pilot Study 2

A sample from Amazon ® Mechanical Turk ® was used for the second pilot study. Workers who participated in Pilot Study 1 were excluded from Pilot Study 2. There were 105 responses. One case was removed due to missing two responses for the latent variable IE. Five cases were removed due to not being engaged. These participants provided the same Likert response for nearly all of the statements for the observed variables. One participant did not include annual, gross income; therefore, this participant was removed. Seven participants left one item blank. The surrounding values of the other observed variables for the latent variable were used to impute the missing value using known value replacement (Hair et al., 2018). SPSS Statistics ® was used to analyze for outliers via boxplot. There were four extreme outliers in terms of annual, gross income, and these cases were deleted. There were no extreme outliers for age. A total of 94 participants were analyzed for the second pilot study.

The demographic information of the participants indicated 69.5% (66) were male and 30.5% (29) were female. The age groups with the most respondents were 31-40 years old (40.0%) and 41-50 years old (24.2%). Caucasian (White, non-Hispanic) was the more prominent ethnicity with 78 respondents (82.1%). Table 6 lists the complete demographics of the respondents for Pilot Study 2.

Table 6

Summary of Basic Demographics Characteristics – Pilot Study 2

Characteristics	Subgroup Categories	Frequency (*N*=95)	Percentage
Gender	Male	66	69.5%
	Female	29	30.5%
Age	<=30 years	28	29.5%
	31-40 years	38	40.0%
	41-50 years	23	24.2%
	51-60 year	3	3.2%
	>=60 years	3	3.2%
Ethnicity	Asian descent	5	5.3%
	African descent	5	5.3%
	Latino/Hispanic descent	7	7.4%
	Caucasian (White, non-Hispanic)	78	82.1%
Annual, Gross Income (USD)	<= 10,000	2	2.1%
	10,001-30,000	26	27.4%
	30,001-50,000	40	42.1%
	50,001-70,000	16	16.8%
	70,001-90,000	5	5.3%
	>=90,901	5	5.3%

Upon completion of data preparation, the CFA model (Figure 5) was designed and analyzed with SPSS ® AMOS 27**.** Skewness and kurtosis values were used to identify the normality of the data. All observed variables of the latent variables exhibited normal distributions of skewness and kurtosis, with the highest skewness value of -0.980 reported for PE1 and the highest kurtosis value of -1.029 reported for WTF6. Sposito et al. (1983) recommend 3.3 as the upper threshold for normality; therefore, the data meet the assumption of normality.

SBSS ® AMOS 27 output of the observations farthest from the centroid, or Mahalanobis distance (D^2), was used to check for outliers. There were no cases with a D^2 value greater than 100, and there were no D^2 values, which were distinct from other D^2 values. Therefore, all cases remained in the data set for analysis.

Evaluation of model fit was assessed using the goodness of fit indices listed in Table 7. Comparing the initial values to the recommended values shows that Normed Chi-Square was the only indice that indicated an acceptable model fit. As Byrne (2016) suggested, modification indices (MI) were examined to covary error terms with high MIs and theoretical context. The MI for e2 and e3 had the highest relevant MI; therefore, these two error terms were covaried. Re-evaluation of model fit resulted in the modified values listed in Table 7. The MIs were examined again, but no other meaningful MIs could be considered.

Table 7

Goodness of Fit Indices - Pilot Study 2

Indices	Initial Value	Modified Value	Recommended value
Comparative Fit Index (CFI)	.907	.917	≥0.95
Goodness of Fit Index (GFI)	.819	.826	≥0.90
Adjusted Goodness of Fit Index (AGFI)	.758	.765	≥0.90
Normed Fit Index (NFI)	.783	.793	≥0.90
Root Mean Square Error of Approximation (RMSEA)	.077	.073	≤0.06
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	1.56	1.50	$1< \chi 2/df<3$

The modified values are not greater than or equal to the recommended values; however, they are reasonably close considering the small sample size of the pilot study. It was decided they were acceptable for the pilot study and to continue with reliability and validity assessments, as the primary purpose of the pilot study was to assess the instrument and study procedures.

The reliability was calculated with results from the SPSS ® AMOS 27 output. Construct Reliability (CR) was calculated according to Equation 2 in Chapter 3 using Microsoft Excel ®. Cronbach's Alpha was calculated with SPSS Statistics ®. CR and

Cronbach's Alpha values for all latent variables are greater than the acceptable value of .70. The reliability results are shown in Table 8.

Table 8

Reliability and Validity – Pilot Study 2

Latent Variables	Observed Variables	Factor Loadings	CR	Cronbach's Alpha	AVE	MSV
Personal Escape (PE)	PE1	.703	.740	.743	**.488**	.424
	PE2	.653				
	PE3	.737				
Interpersonal Escape (IE)	IE1	.840	.842	.840	.641	.461
	IE2	.709				
	IE3	.845				
Personal Seeking (PS)	PS1	.813	.809	.745	.594	.461
	PS2	.904				
	PS3	.552				
Interpersonal Seeking (IS)	IS1	.674	.703	.701	**.444**	.424
	IS2	.731				
	IS3	.585				
Willingness to Fly (WTF)	WTF1	.781	.911	.909	.593	.259
	WTF2	.777				
	WTF3	.779				
	WTF4	.773				
	WTF5	.793				
	WTF6	.677				
	WTF7	.804				

With reference to convergent validity, all factor loadings are higher than the recommended value of .50 (Hair et al., 2018). The AVE for PE and IS are slightly lower than the acceptable value of .50. Due to adequate factor loadings, acceptable CR values, and this being the pilot study, no changes based on the AVE for PE and IS were deemed necessary. The value of MSV is lower than the value of AVE for each latent variable; therefore, adequate discriminant validity is demonstrated for all latent variables. Additionally, as shown in Table 9, the square root of AVE for each latent factor is greater than the inter-construct correlations. The reliability and validity are adequate to move forward with the full study.

Table 9

Discriminant Validity – Pilot Study 2

Latent Factors	IE	PS	IS	PE	WTF
IE	**.800**				
PS	.679	**.771**			
IS	.471	.618	**.666**		
PE	.335	.328	.651	**.699**	
WTF	.267	.509	.402	.424	**.770**

Note. Bolded numbers are square of AVE.

Main Study

A sample from Amazon ® Mechanical Turk ® was used for the main study. Workers who participated in Pilot Study1 and 2 were excluded from the main study. The survey instrument is included in Appendix B. As noted in Chapter 3, the minimum sample size needed for the study was 870 respondents. A total of 929 responses were obtained from Amazon ® Mechanical Turk ® in less than 24 hours.

Data Preparation

The data were examined for completeness using Microsoft Excel ®. Four respondents did not answer the attention check question appropriately and were deleted, leaving 925 cases. Three cases were removed due to missing three responses for the latent variable IE. One case was removed due to missing three responses for the latent variable IS. Two cases were removed due to missing three responses for the latent variable PS. One case was removed due to missing three responses for the latent variable WTF. After removing these cases, 918 cases remained. Twenty-eight cases were removed due to not being engaged, leaving 890 cases. These participants provided the same Likert response for nearly all of the statements for the Tourism Motivation observed variables. Respondents who had nearly all the same responses to the Willingness to Fly observed

variables, but varying responses to the Tourism Motivation observed variables were considered engaged respondents and retained. Finally, one respondent stated they were from Malaysia, and another stated they were from Venezuela; these were removed, leaving 888 cases.

Next, the data were examined for missing values. Twenty-four respondents provided a two-digit number for annual gross income (i.e., 24); these responses were converted to a five-digit number (i.e., 24,000). One respondent provided an annual gross income of zero. Respondents were required to have completed greater than 100 HITs with a greater than 98% approval rating; therefore, it was assumed the respondent made more than zero dollars in annual gross income. This case was deleted. Seven participants did not respond to annual gross income. These values were replaced with the median annual gross income of $45,000 for all respondents who did provide a response. One respondent replied with an age of 358, and the case was removed, leaving 886 cases. Three respondents did not provide an age. These values were replaced with the average age of 37 for all respondents who did provide a response. Sixty-three missing values were identified across different variables. The surrounding values of the other observed variables for the latent variable were used to impute the missing value using known value replacement (Hair et al., 2018). SPSS Statistics ® was used to analyze for outliers via boxplot. There were fifteen extreme outliers in terms of annual gross income, and these cases were deleted. There was one extreme outlier for age, and the case was deleted. A total of 870 participants were analyzed for the main study. All deleted cases are summarized in Table 10.

Table 10

Deleted Cases – Main Study

Action	Deleted	Remaining Cases
Initial Data	-	929
Attention check question inappropriately answered	4	925
Missing three responses to a single latent variable	7	918
Not engaged	28	890
Were not from the United States	2	888
Reported annual gross income of $0	1	887
Replied with 3-digit age or 358	1	886
Outliers for annual gross income	15	871
Outlier for age	1	870

Test for Non-response Bias

Non-response bias generally reviews respondents who answer a few questions, but do not complete the entire survey instrument. There were no such respondents as all respondents completed the survey. However, there were 39 respondents who were deleted due to missing data and not being engaged (Table 10). Non-response bias assesses if there is a difference between those that completed the survey and those that did not complete the survey (in this case, those who were deleted for missing data and not being engaged). The objective is to conclude if the demographic attributes of respondents differ from those of the non-respondents. A Chi-square test was conducted to measure this difference. As shown in Table 11, none of the demographic attributes had a probability (p) value less than .05. These results demonstrate there is no significant difference between the respondents and non-respondents.

Table 11

Chi-Squared Non-Response Bias Test – Main Study

Demographic Attribute	Chi-square (χ^2)	Probability (*p*)	Significant (Yes/No)
Gender	.703	.951	No
Age	634.83	.384	No
Ethnicity	7.276	1.00	No
Annual, gross income	488.39	.776	No

Demographics

Gender, age, ethnicity, and annual gross income were the demographic information collected for the study. The participants were also asked what country they were from to verify they were from the United States. The demographic questions were not mandatory; participants could answer all, some, or none of the demographic questions. The demographics of participants for the main study are presented in Table 12.

Gender. The participants' demographic information indicated that 66.0% (574) were male and 33.4% (291) were female. Five respondents (0.6%) did not provide a gender. This percentage of male and female participants is not consistent with the general population of the United States. The percentage of males and females age 18 or older in the United States is approximately 48.0% and 52.0%, respectively (U.S. Census Bureau, 2019). The gender ratio of Amazon ® Mechanical Turk ® workers varies slightly from the general population of the United States with 52.8% being male and 47.1% being female (Difallah et al., 2018).

Age. The age groups with the most respondents were 30-39 years old (39.9%) and 18-29 years old (24.5%). The percentage of the other age groups are as follows: 40-49 years (22.4%), 50-59 years (8.3%), and greater than or equal to 60 years (4.9%). As shown in Table 12, the age group percentages of the United States population are 18-29

years old (20.9%), 30-39 years (17.3%), 40-49 years (15.9%), 50-59 years (16.6%), and greater than or equal to 60 years (29.3%) (U.S. Census Bureau, 2019). The survey participants 18-29 years (24.5%), although slightly higher, is fairly consistent with the general population of the United States between 18-29 years (20.9%), however, the other age groups were less consistent. Respondents 30-39 years (39.9%) and 40-49 years (22.4%) were higher than the same age groups within the general population of the United States. In contrast, the survey participants 50-59 years (8.3%) and those greater than or equal to 60 years (4.9%) were a lower percentage than the general population of the United States.

Ethnicity. The majority of respondents replied with the ethnicity of Caucasian (White, non-Hispanic) (88.6%). The percentages of the other ethnic groups were African descent (4.8%), Asian descent (3.3%), Latino/Hispanic descent 2.2%, and other 1.1%. According to the U.S. Census Bureau (2021), residents of the United States who report as White, non-Hispanic is 60.1%, Black or African is 13.4%, Asian is 5.9%, Latino/Hispanic is 18.5%, and all other races are 4.3%. Although slightly lower, the ethnicity of respondents is relatively consistent with the percentage breakdown of the general population of the United States aside from Latino/Hispanic, which was only 2.2% of the respondents, but 18.5% of the United States' population.

Annual Income. The majority of respondents reported an annual gross income of $50,000 to $74,999 (27.8%) and $35,000 to $49,999 (23.3%). The percentages of the remaining income categories were less than $15,000 (5.2%), $15,000 to $24,999 (9.4%), $25,000 to $34,999 (16.1%), $75,000 to $99,999 (14.4%), $100,000 to $149,999 (3.3%), and $150,000 to $199,999 (0.5%). The income break down in 2020 for the United States

population is less than $15,000 (9.4%), $15,000 to $24,999 (8.7%), $25,000 to $34,999 (8.1%), $35,000 to $49,999 (11.6%), $50,000 to $74,999 (16.5%), $75,000 to $99,999 (12.2%), $100 to $149,999 (15.3%), $150,000 to $199,999 (8.0%), and $200,000 and above (10.3%). The median reported annual, gross income for the study was $45,000 compared to $67,521 for the United States' population. The mean reported annual gross income for the study was $48,600 compared to $97,026 for the United States' population (Shrider et al., 2021). The median, mean, and percentage of respondents with an annual gross income less than $15,000 or greater than $100,000 is lower when compared to the United States' population. The remaining income categories from the study are higher among respondents when compared to the United States' population.

Table 12

Summary of Basic Demographics Characteristics – Main Study

Characteristics	Subgroup Categories	Frequency (*N*=870)	Percentage	Percentage of United States Population
Age	18-29 years	213	24.5%	20.9%
	30-39 years	347	39.9%	17.3%
	40-49 years	195	22.4%	15.9%
	50-59 year	72	8.3%	16.6%
	>=60 years	43	4.9%	29.3%
Gender	Male	574	66.0%	48.0%
	Female	291	33.4%	52.0%
	Blank	5	0.6%	
Ethnicity	Asian descent	29	3.3%	5.9%
	African descent	42	4.8%	13.4%
	Latino/Hispanic descent	19	2.2%	18.5%
	Caucasian (White, non-Hispanic)	771	88.6%	60.1%
	Other	9	1.1%	4.3%
Annual, Gross Income (USD)	< 15,000	45	5.2%	9.4%
	15,000-24,999	82	9.4%	8.7%
	25,000-34.999	140	16.1%	8.1%
	35,000-49,999	203	23.3%	11.6%
	50,000-74,999	242	27.8%	16.5%
	75,000-99,999	125	14.4%	12.2%
	100,000-149,999	29	3.3%	15.3%
	150,000-199,999	4	0.5%	8.0%
	200,000 and over	0	0.0%	10.3%

Note. For percentage of United States Population, Hispanics may be of any race, so Hispanic may also are included in applicable race categories. Therefore, the percentage is higher than 100%.

Descriptive Statistics

The mean, standard deviation (*SD*), kurtosis, and skewness are presented for the observed and latent variables. The latent variables discussed are personal escape (PE), interpersonal escape (IE), personal seeking (PS), interpersonal seeking (PS), and willingness to fly (WTF). An overview of the descriptive statistics is displayed in Table 13.

Table 13

Descriptive Statistics for Latent and Observed Variables

Latent Variable	Observed Variable	Mean	Average Mean for Latent Variable	Standard Deviation (*SD*)	Average SD for Latent Variable	Skewness	Kurtosis
PE	PE1	3.95	3.97	.907	.897	-.871	.976
	PE2	3.90		.930		-.827	.553
	PE3	4.06		.854		-.772	.372
IE	IE1	3.57	3.52	1.081	1.092	-.621	-.239
	IE2	3.51		1.098		-.554	-.375
	IE3	3.49		1.097		-.537	-.372
PS	PS1	3.75	3.81	.983	.962	-.818	.521
	PS2	3.71		1.025		-.844	.403
	PS3	3.96		.879		-.738	.437
IS	IS1	3.91	3.94	.842	.857	-.728	.685
	IS2	3.91		.855		-.688	.513
	IS3	3.99		.875		-.798	.578
WTF	WTF1	3.92	3.75	.950	1.009	-.936	.857
	WTF2	3.76		1.008		-.816	.431
	WTF3	3.71		1.012		-.730	.209
	WTF4	3.84		.965		-.889	.736
	WTF5	3.70		1.024		-.735	.173
	WTF6	3.55		1.115		-.651	-.290
	WTF7	3.76		.991		-.797	.422

Reviewing the mean and standard deviation for the observed and latent variables provides a generalized view of the centrality and dispersion of the responses for these variables. Each observed variable was measured on a 5-point Likert response format ranging from 1 (strongly disagree) to 5 (strongly agree). The mean of all latent and observed variables was above the neutral rating of 3, ranging from a low of 3.52 for IE and a high of 3.97 for PE. The highest *SD* was 1.115 for WTF6, and the lowest *SD* was 0.842 for IS1.

Skewness and kurtosis values were used to identify the normality of the data. All observed variables exhibited normal distributions of skewness and kurtosis, with the highest skewness value of -0.935 reported for WTF1 and the highest kurtosis value of

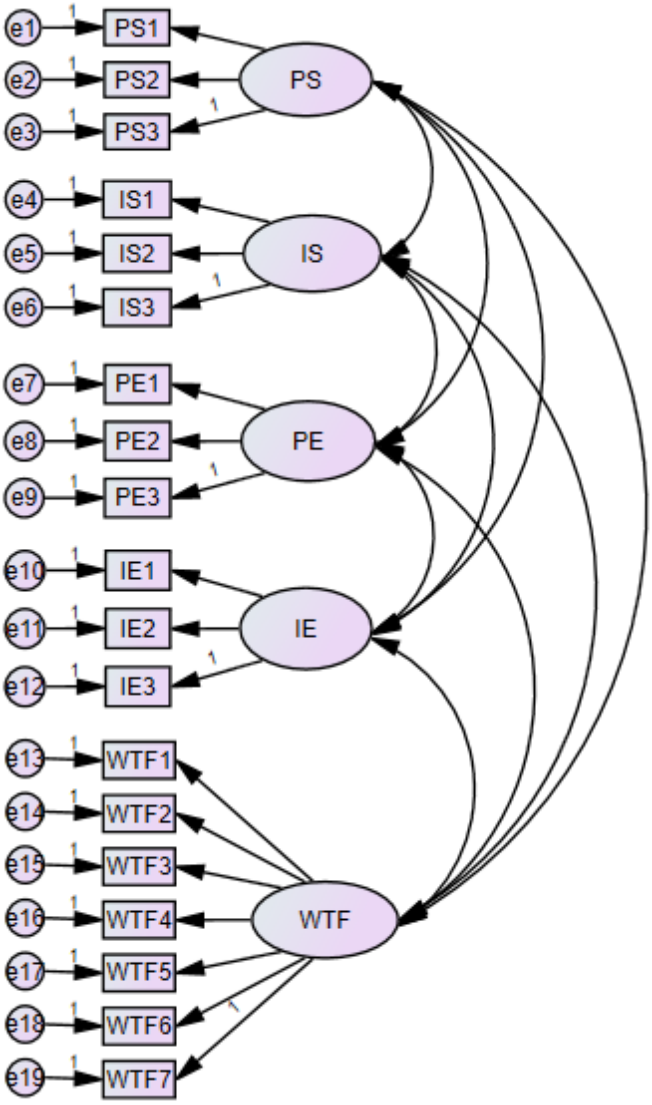
0.846 reported for WTF1. Sposito et al. (1983) recommend 3.3 as the upper threshold for normality. Therefore, the data meet the assumption of normality.

Confirmatory Factor Analysis

The confirmatory factor analysis (CFA) was executed using SPSS ® AMOS 27. This section provides the results of the CFA analysis. An illustration of the initial CFA is included in Figure 6.

Figure 6

Initial CFA Model



The initial model fit is shown in Table 14. All goodness of fit (GOF) indices were acceptable except the Comparative Fit Index (CFI) and Normed Chi-Square (CMIN/df). CFI at 0.947 is just slightly lower than the recommended value of 0.95. CMIN/df at 3.291 is slightly higher than the recommended value of less than 3.0.

Table 14

Goodness of Fit Indices – Initial CFA

Indices	Initial Value	Recommended Value	Acceptable
Comparative Fit Index (CFI)	.947	≥0.95	No
Goodness of Fit Index (GFI)	.941	≥0.90	Yes
Adjusted Goodness of Fit Index (AGFI)	.921	≥0.90	Yes
Normed Fit Index (NFI)	.926	≥0.90	Yes
Root Mean Square Error of Approximation (RMSEA)	.051	≤0.06	Yes
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	3.287	$1< \chi 2/df<3$	No

Mahalanobis distance (D^2) was used to check for outliers. There were no cases with a D^2 value greater than 100, and there were no D^2 values, which were distinct from other D^2 values. Therefore, all cases remained in the dataset for analysis.

A post hoc analysis was conducted due to the unacceptable CFI and CMIN/df values. As Byrne (2016) recommended, MIs were examined, and error terms with high MIs with theoretical context were covaried in an iterative process. The highest MI value was 26.286 between e13 and e16. These error terms (e13 and e16) were covaried, and the CFA was rerun. The CFI of .952 was within the recommended value of .95; however, the CMIN/df at 3.117 remained higher than the recommended value of less than 3.0. The next highest MI of 18.947 was between e2 and e3, and these two error terms were

covaried. After rerunning the CFA, CMIN/df of 2.948 was below the recommended value of 3.0. The GOF indices of the interim CFA model are listed in Table 15, and the interim CFA model is displayed in Figure 7.

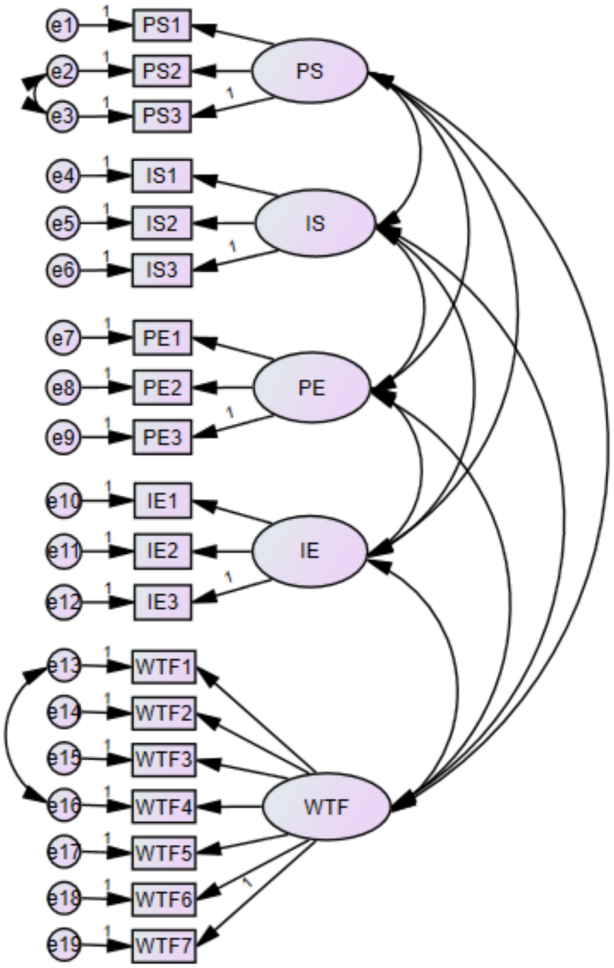
Table 15

Goodness of Fit Indices – Interim CFA

Indices	Interim Value	Recommended Value	Acceptable
Comparative Fit Index (CFI)	.956	≥0.95	Yes
Goodness of Fit Index (GFI)	.950	≥0.90	Yes
Adjusted Goodness of Fit Index (AGFI)	.932	≥0.90	Yes
Normed Fit Index (NFI)	.935	≥0.90	Yes
Root Mean Square Error of Approximation (RMSEA)	.047	≤0.06	Yes
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	2.948	$1< \chi 2/df<3$	Yes

Figure 7

Interim CFA Model



Reliability and Validity Testing. The data were assessed next for reliability and validity. All factor loadings are higher than the recommended value of .50 (Hair et al., 2018), with PS3 being the lowest at .497, which is near enough to .50. Additionally, Dragan and Topolsek (2014) suggest with a sample size greater than 350, a factor loading greater than .30 is acceptable. Finally, Hair et al. (2021) suggest deleting factors between .40 and .708 only when it increases internal consistency reliability or convergent validity above recommended values. The internal consistency reliability was calculated with results from the SPSS ® AMOS 27 output. Construct Reliability (CR) was calculated

according to Equation 2 in Chapter 3 using Microsoft Excel ®. Cronbach's Alpha was calculated with SPSS Statistics ®. CR and Cronbach's Alpha values for PE, PS, and IS are lower than the proposed acceptable value of .70. However, Hair et al. (2021) discuss that a CR of .60 is acceptable in exploratory research. The research is certainly confirmatory; however, it is exploring the use of the tourism motivation scale with the willingness to fly scale.

Additionally, Hair et al. (2021) mention the CR can tend to be too liberal and the Cronbach's Alpha can tend to be too conservative; the real reliability is probably somewhere in between. Bagozzi and Yi (2012) support some latitude in factor loadings below .70 and the cutoff for CR and Cronbach's Alpha with models that have satisfactory model fit. For these reasons, the factor loadings, CR, and Cronbach's Alpha for all variables were considered moderately acceptable. The reliability results are shown in Table 16.

Table 16

Reliability and Validity – Main Study – Interim CFA

Latent Variables	Observed Variables	Factor Loadings	CR	Cronbach's Alpha	AVE	MSV
Personal Escape (PE)	PE1	.639	**.649**	**.642**	**.385**	.461
	PE2	.705				
	PE3	.501				
Interpersonal Escape (IE)	IE1	.739	.800	.799	.571	.391
	IE2	.772				
	IE3	.756				
Personal Seeking (PS)	PS1	.759	.727	**.671**	**.480**	.520
	PS2	.785				
	PS3	.497				
Interpersonal Seeking (IS)	IS1	.655	**.639**	**.639**	**.375**	.520
	IS2	.660				
	IS3	.509				
Willingness to Fly (WTF)	WTF1	.665	.890	.891	.537	.371
	WTF2	.763				
	WTF3	.750				
	WTF4	.684				
	WTF5	.769				
	WTF6	.712				
	WTF7	.780				

Note: Bold numbers identify less than acceptable value.

Regarding convergent validity, the AVE for PS, PE and IS are lower than the acceptable value of .50. The value of MSV is higher than the value of AVE for PS, PE, and IS; therefore, adequate discriminant validity is not demonstrated for these latent variables. Additionally, as shown in Table 17, the square root of AVE for each latent variable is greater than the inter-construct correlations except for PS and IS, and IS and PE. Convergent and discriminant validity are not acceptable.

Table 17

Discriminant Validity – Main Study

Latent Factors	IE	PS	IS	PE	WTF
IE	**.756**				
PS	.625	**.693**			
IS	.422	.721[a]	**.612**		
PE	.465	.439	.679[a]	**.621**	
WTF	.457	.609	.502	.351	**.733**

Note. Bolded numbers are square root of AVE. [a] inter-construct correlations greater than the square of AVE.

While respecting the theoretical perspective of SEM, model respecification was further explored in a sound and logical manner in an attempt to improve validity. Reviewing the AVEs for the latent variables, as shown in Table 16, IS had the lowest AVE at .375, and the CR and Cronbach's Alpha were also slightly lower than PE at .639. As suggested by Hair et al. (2021), I explored deleting an observed variable of IS to increase internal consistency reliability or convergent validity above the recommended values. IS showed a high correlation with PS and PE based on the inter-construct correlations of .721 and .679 (Table 17). IS3 had a lower factor loading than IS1 and IS2 (Table 16).

Additionally, IS3 demonstrated cross loading with PE based on a MI of 27.003, and the error term for IS3 (e6) showed covariance with PE (specifically, there was high covariance between e6 and e9 based on a MI of 26.674). IS3 was removed from the model. With IS3 removed, the model fit improved with a slight increase in all GOF indices. As shown in Table 18, the AVE for IS did increase from .375 to .414, but the MSV remained higher than AVE with an MSV of .608. Additionally, the CR and Cronbach's Alpha for IS decreased from .639 to .586. The AVE for PE remained low at

.386, and the AVE for PS remained at .481. The model respecification continued with an attempt to further increase convergent validity, and, at this point, accepted the moderately lower than acceptable internal consistency reliability or discriminant validity concerns.

PE was the next logical latent variable to examine as the AVE was the lowest at .386 (Table 18). PE3 had a factor loading of .486. PS3 did demonstrate high cross loading with WTF based on MI with WTF1 of 31.900 and WTF4 of 38.188, and PS3 had a factor loading at .496. It was decided to remove PE3 was more sound and logical than removing PS3, at this point, because the AVE for PE was lower than the AVE for PS (.481). PE3 was removed and the model was rerun. The model fit improved further. The AVE for PE increased to .461. The MSV for PE decreased from .461 to .366 resulting in AVE for PE being greater than MSV. The CR decreased slightly to .630, but removing PE3 improved convergent and discriminant validity.

The AVE for PS remained .481, but the MSV increased to .608 resulting in MSV greater than AVE. Additionally, the square root of AVE was .693 with an inter-construct correlation of PS and IS at .780 representing discriminant validity issues. PS3 was covarying with WTF, specifically a MI with WTF1 of 31.929 and WTF4 of 38.267. Finally, the factor loading of PS3 was the lowest of all observed variables at .496. PS3 was removed and the model was rerun.

Table 18

Reliability and Validity – CFA Respecification

Latent Variables	Recommended Value	Acceptable Value	Interim CFA	IS3 Removed	PE3 Removed	PS3 Removed
Personal Escape (PE)						
CR	>.70	>.60	.649	.648	.630	.630
Cronbach's Alpha	>.70	>.70	.642	.642	.628	.628
AVE	>.50	>.414[a]	**.385**	**.386**	.461	.461
MSV	<AVE	<AVE	**.461**	**.406**	.366	.365
Interpersonal Escape (IE)						
CR	>.70	>.60	.800	.800	.800	.800
Cronbach's Alpha	>.70	>.70	.799	.799	.799	.799
AVE	>.50	>.414[a]	.571	.571	.571	.571
MSV	<AVE	<AVE	.391	.389	.389	.388
Personal Seeking (PS)						
CR	>.70	>.60	.727	.728	.728	.770
Cronbach's Alpha	>.70	>.70	.671	.671	.671	.769
AVE	>.50	>.414[a]	.481	.481	.481	.626
MSV	<AVE	<AVE	**.520**	**.608**	**.608**	.536
Interpersonal Seeking (IS)						
CR	>.70	>.60	**.**639	**.586**	**.586**	**.586**
Cronbach's Alpha	>.70	>.70	.639	**.586**	**.586**	**.586**
AVE	>.50	>.414[a]	**.375**	.414	.414	.414
MSV	<AVE	<AVE	**.520**	**.608**	**.608**	**.536**
Willingness to Fly (WTF)						
CR	>.70	>.60	.890	.890	.890	.890
Cronbach's Alpha	>.70	>.70	.891	.891	.891	.891
AVE	>.50	>.414[a]	.537	.538	.538	.537
MSV	<AVE	<AVE	.371	.370	.370	.317

Note: Bold numbers identify less than acceptable value. [a]with CR >.60

The modified CFA as depicted in Figure 8 demonstrated acceptable model fit as shown in Table 19. However, some reliability and validity concerns remained. As shown in Table 20, the CR and Cronbach's Alpha for IS are below .60, the AVE is below .50, and MSV is greater than AVE. Additionally, the AVE for PE is slightly lower than the

recommended value of .50. The AVEs below .50 do not meet the conventional value of greater than .50; however, Fornell and Larcker (1981) suggest an AVE equal to greater than .414 is acceptable with a CR above .60. PE meets this requirement with a CR of .630 and AVE of .461, and thus is accepted as having adequate convergent validity. The MSV greater than AVE for IS demonstrated a discriminant validity issue according to Fornell and Larcker's (1981) measurement. Additionally, Table 21 shows a discriminant validity concern with inter-construct correlation between IS and PS greater than the square root of AVE for IS.

Figure 8 *Modified CFA Model*

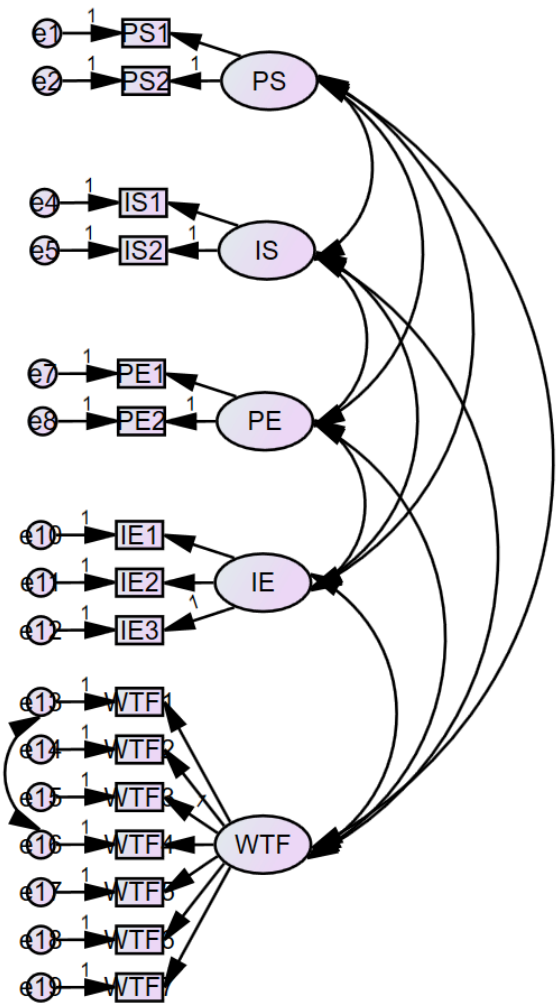


Table 19

Goodness of Fit Indices – Modified CFA

Indices	Value	Recommended value	Acceptable
Comparative Fit Index (CFI)	.986	≥0.95	Yes
Goodness of Fit Index (GFI)	.976	≥0.90	Yes
Adjusted Goodness of Fit Index (AGFI)	.966	≥0.90	Yes
Normed Fit Index (NFI)	.970	≥0.90	Yes
Root Mean Square Error of Approximation (RMSEA)	.031	≤0.06	Yes
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	1.819	$1< \chi 2/df<3$	Yes

Table 20

Reliability and Validity – Modified CFA

Latent Variables	Observed Variables	Factor Loadings	CR	Cronbach's Alpha	AVE	MSV
Personal Escape (PE)	PE1	.641	.630	.628	.461	.365
	PE2	.715				
Interpersonal Escape (IE)	IE1	.737	.800	.799	.571	.388
	IE2	.775				
	IE3	.755				
Personal Seeking (PS)	PS1	.792	.770	.769	.626	.536
	PS2	.790				
Interpersonal Seeking (IS)	IS1	.632	**.586**	**.586**	.414	**.536**
	IS2	.655				
Willingness to Fly (WTF)	WTF1	.662	.890	.891	.537	.317
	WTF2	.764				
	WTF3	.750				
	WTF4	.681				
	WTF5	.770				
	WTF6	.714				
	WTF7	.779				

Note: Bold numbers identify less than acceptable value.

Table 21

Discriminant Validity – Modified CFA

Latent Factors	IE	PS	IS	PE	WTF
IE	**.755**				
PS	.623	**.791**			
IS	.478	.732 [a]	**.644**		
PE	.502	.403	.604	**.679**	
WTF	.457	.563	.559	.365	**.733**

Note. Bolded numbers are square root of AVE. [a] inter-construct correlations greater than the square of AVE.

More recently, though, Henseler et al. (2015) demonstrated Fornell and Larcker's (1981) method of assessing discriminant validity does not reliably reveal discriminant validity issues. There is support for heterotrait-monotrait ratio of correlation (HTMT) as a more acceptable measure of discriminant validity (Byrne, 2016; Hensler et al., 2015; Hair

et al., 2021). The HTMT correlation establishes construct validity with a more systematic assessment of discriminant validity. It is the average of the correlations of observed variables across latent variables relative to the average of the correlations of the observed variables within the same latent variable. In calculating HTMT, discriminant validity issues exist when HTMT values are high. HTMT values below .90 are considered acceptable, but .85 is a more conservative threshold value for demonstrating discriminant validity (Hair et al., 2021; Hensler et al., 2015; Kline, 2016). This study will use the more conservative value of .85 because of the Fornell and Larcker (1981) discriminant validity issues previously reported. Table 22 shows HTMT values for the model depicted in Figure 8; all values are below .85. With this demonstration of acceptable discriminant validity, the remaining unacceptable measure is reliability of IS as demonstrated by CR and Cronbach's Alpha of .586.

Table 22

Heterotrait-Monotrait Ratio of Correlation (HTMT) – Modified CFA

Correlation	HTMT ratio
WTF<-->IE	.456
WTF<-->PE	.380
WTF<-->IS	.563
WTF<-->PS	.559
IE<-->PE	.504
IE<-->PS	.623
IE<-->IS	.476
PE<-->IS	.608
PE<-->PS	.409
IS<-->PS	.733

It is common convention to have no less than three observed variables per latent variable; however, it is still acceptable to have two observed variables for a latent variable if the model remains over-identified (Bagozzi & Yi, 2012; Hair et al., 2018; Fornell & Larcker, 1981; Kline, 2016). The model in Figure 8 is over-identified with 93

degrees of freedom. The theory does not support further modification of the model; therefore, it was decided to proceed with the structural equation model in accordance with the proposed research and hypotheses in Chapter 3 despite the slightly lower than acceptable internal consistency reliability of IS.

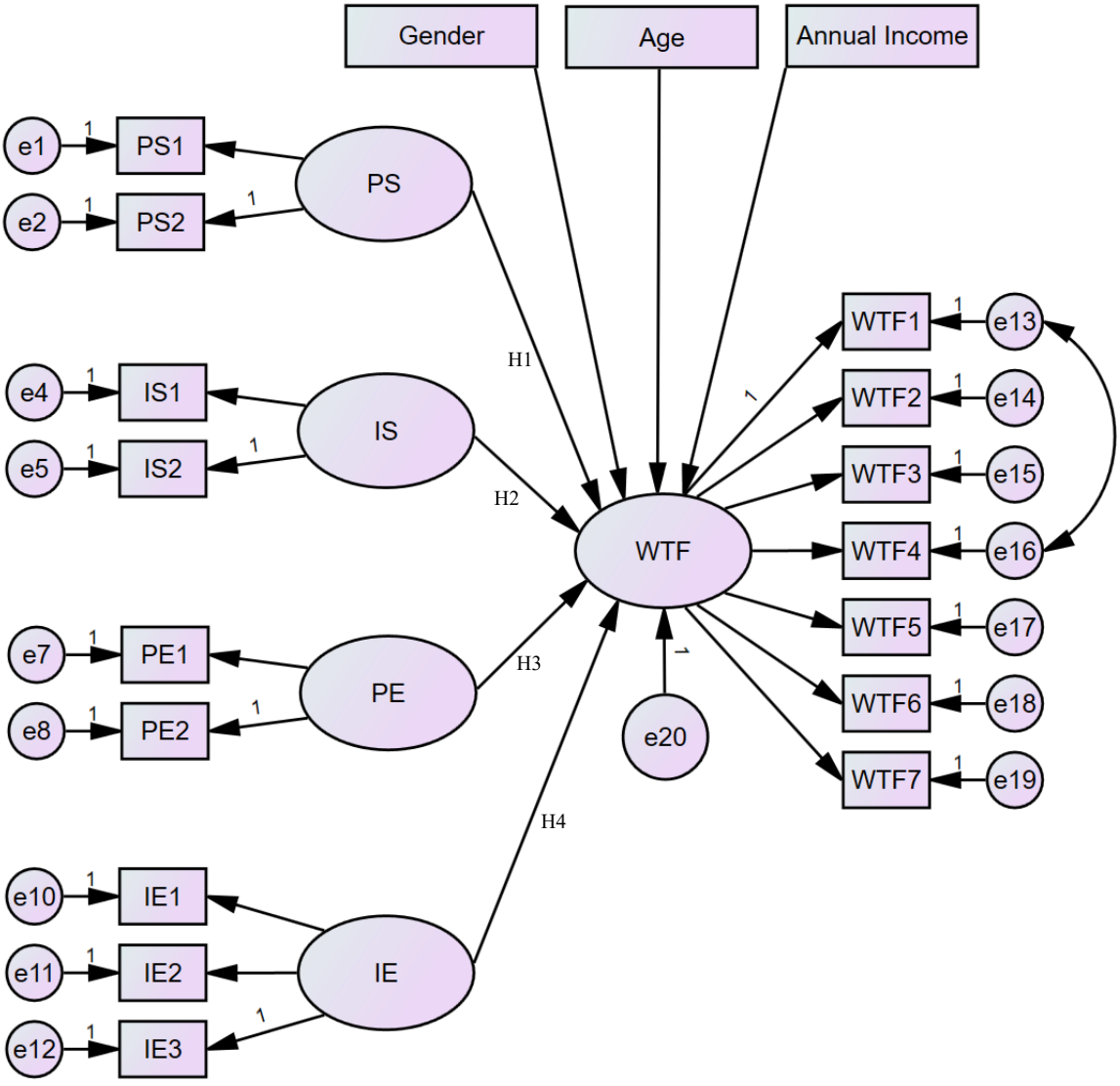
Structural Equation Modeling

The structural equation model (SEM) is the next step in the analysis process, and was accomplished using SPSS ® AMOS 27. CFA is the measurement model evaluating the latent variables and the relationships among these variables. The SEM allows for testing the hypotheses to see if the theoretical model reflects the observed data (Dragan & Topolsek, 2014; Hair et al., 2018). The SEM is shown in Figure 9.

The SEM model in Figure 9 was developed from the re-specified CFA model in Figure 8. A residual term was added to WTF, the endogenous variable; gender, age and annual income were added as control variables; and hypotheses were added as one way arrows from the exogenous variables to the endogenous variable (WTF).

Figure 9

Structural Equation Model



Note. Covariance arrows were removed for clarity.

The SEM model was evaluated following the same process used to assess the CFA model. Skewness and kurtosis values were used to identify the normality of the data. As with the CFA, all observed variables exhibited normal distributions of skewness and kurtosis, there were no cases with a D^2 value greater than 100, and there were no D^2

values, which were distinct from other D^2 values. For the control variables, age had the highest skewness at 1.065, and gender had the highest kurtosis at -1.523. The GOF indices shown in Table 23 demonstrate acceptable fit for the SEM; therefore, no further model re-specification was needed.

Table 23

Goodness of Fit Indices – SEM with Control Variables

Indices	Value	Recommended Value	Acceptable
Comparative Fit Index (CFI)	.984	≥0.95	Yes
Goodness of Fit Index (GFI)	.975	≥0.90	Yes
Adjusted Goodness of Fit Index (AGFI)	.963	≥0.90	Yes
Normed Fit Index (NFI)	.963	≥0.90	Yes
Root Mean Square Error of Approximation (RMSEA)	.028	≤0.06	Yes
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	1.703	$1< \chi 2/df<3$	Yes

Hypothesis Testing – With Control Variables

SEM hypotheses testing involved analyzing the relationship of each exogenous variable with the endogenous variable, WTF. The relationship is statistically significant if the Critical Ratio (C.R.) is greater than (>) plus or minus 1.96 and the *p*-value is less than (<) .05 (Byrne, 2016). The standardized regression weight estimate (factor loading) assesses the relative strength of the relationship while the unstandardized regression weight provides the change in the endogenous (predicted) variable with one unit change in the exogenous (predictor) variable. Table 24 presents the SEM hypotheses testing information. Hypotheses 1 and 2 are supported; Hypotheses 3 and 4 are not supported. Each hypothesis is discussed further below. The SEM model with the standardized factor loadings is displayed in Figure 10. Gender and age were statistically significant as control variables, but based on a C.R. of 1.185 and *p*-value of .236 annual income was not

significant. The squared multiple correlations (R^2) for the endogenous (predicted) variable, WTF, was .402. The R^2 indicates how much of the variance in WTF is accounted for by the exogenous (predictor) variables.

Table 24

Hypotheses Testing for SEM with Control Variables

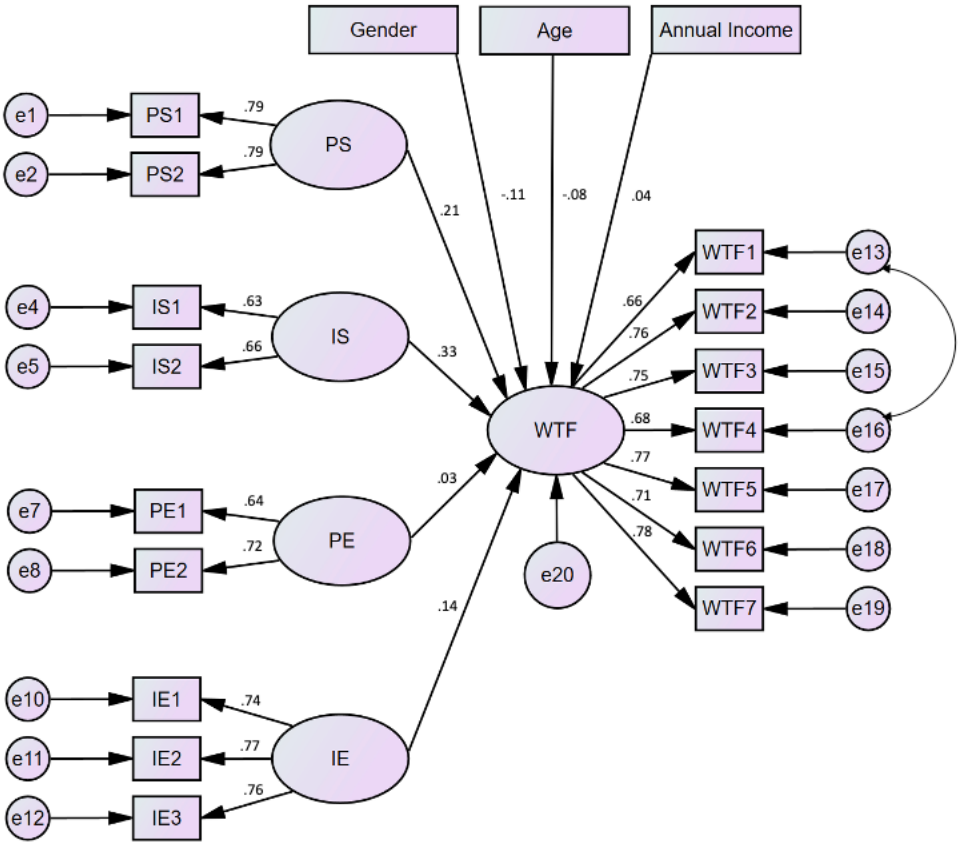
Hypotheses / Control Variable	Standardized Estimate	Unstandardized Estimate	S.E.	C.R.	*p*-value	Supported (Yes/No)
H_1: There is a significant positive relationship between personal seeking and willingness to fly	.210	.163	.074	2.215	.027	Yes
H_2: There is a significant positive relationship between interpersonal seeking and willingness to fly	.329	.367	.124	2.965	.003	Yes
H_3: There is a significant negative relationship between personal escape and willingness to fly	.026	.024	.067	.360	**.719**	No
H_4: There is a significant negative relationship between interpersonal escape and willingness to fly	.142	.107	.046	2.348	.019	No
Gender <--> WTF	-.113	-.151	.042	-3.607	***	N/A
Age <--> WTF	-.080	-.005	.002	-2.319	.020	N/A
Annual Income <--> WTF	.037	.000	.000	1.185	**.236**	N/A

Note: Bold numbers identify less than acceptable value.

*** equals p <.001.

Figure 10

Structural Equation Model with Standardized Factor Loadings



Note. Covariance arrows were removed for clarity. R^2 for WTF = 0.402

Hypothesis 1 (there is a significant positive relationship between personal seeking and willingness to fly) was supported based on a C.R. of 2.133 and $p = .033$. The results indicate that a one-unit increase in personal seeking leads to a .163 increase in willingness to fly.

Hypothesis 2 (there is a significant positive relationship between interpersonal seeking and willingness to fly) was supported based on a C.R. of 3.005 and $p = .003$. The results indicate a one-unit increase in personal seeking leads to a .367 increase in willingness to fly.

Hypothesis 3 (there is a significant negative relationship between personal escape and willingness to fly) was not supported based on a C.R. of 0.455 and $p = .649$. The results indicate personal escape was not a significant factor in willingness to fly.

Hypothesis 4 (there is a significant negative relationship between interpersonal escape and willingness to fly) was not supported. The C.R. of 2.322 and $p = .020$ are adequate to consider interpersonal escape a significant factor, however, the relationship was positive and not negative as hypothesized. The results indicate a one-unit increase in interpersonal escape leads to a .107 increase in willingness to fly.

Hypothesis Testing – Without Control Variables

The results should be analyzed with and without the control variables (Becker, 2005). Gender, age, and annual income were removed from the SEM in order to evaluate the model and test the hypotheses without the control variables. The model fit without the control variables is presented in Table 25. The model fit remained acceptable with a slight increase in each of the GOF indices. As for the hypotheses testing, Hypotheses 1 and 2 remained supported, Hypothesis 3 remained non-significant, and Hypothesis 4 remained significant but unsupported. The results are shown in Table 26. The R^2 for the endogenous (predicted) variable, WTF, was .379, a decrease of .023 from the SEM with control variables. The results suggest age and gender did have a slightly negative statistically significant effect on willingness to fly, but did not contribute significantly to the final model.

Table 25

Goodness of Fit Indices – SEM Without Control Variables

Indices	Value	Recommended value	Increase from SEM with control variables
Comparative Fit Index (CFI)	.986	≥0.95	+.002
Goodness of Fit Index (GFI)	.976	≥0.90	+.001
Adjusted Goodness of Fit Index (AGFI)	.966	≥0.90	+.002
Normed Fit Index (NFI)	.970	≥0.90	+.007
Root Mean Square Error of Approximation (RMSEA)	.031	≤0.06	+.003
Normed Chi-Square ($\chi 2$ /df or CMIN/df)	1.819	$1< \chi 2/df<3$	+.183

Table 26

Hypotheses Testing for SEM Without Control Variables

Hypotheses / Control Variable	Standardized Estimate	Unstandardized Estimate	S.E.	C.R.	*p*-value	Supported (Yes/No)
H_1: There is a significant positive relationship between personal seeking and willingness to fly	.236 (+.026)	.183 (+.020)	.073	2.503	.012	Yes
H_2: There is a significant positive relationship between interpersonal seeking and willingness to fly	.308 (-.021)	.345 (-.022)	.124	2.791	.005	Yes
H_3: There is a significant negative relationship between personal escape and willingness to fly	.001 (-.025)	.001 (-.023)	.067	.016	**.987**	No
H_4: There is a significant negative relationship between interpersonal escape and willingness to fly	.163 (+.021)	.124 (+.017)	.046	2.706	.007	No

Note. Numbers in paratheses reflect the change from the SEM with control variables.

Summary

This chapter presented the analysis of the research results. A pilot study was initially conducted to test the survey instrument and request feedback from participants before completing the main study. The first pilot study resulted in modifying the question

on annual income, and fixing some formatting issues with the instructions and questions. The second pilot study provided acceptable results, and no further modifications were made before executing the main study.

There were 870 usable participants for the main study. Demographic results revealed more male than female respondents with most respondents being 30-39 years old and Caucasian with a gross income between $35,000 and $74,999. Upon reviewing the descriptive statistics, a generalized view of the centrality and dispersion of the responses identified no significant anomalies, and the data meet the assumption of normality. The initial assessment of the CFA demonstrated acceptable model fit with convergent and discriminant validity issues. As a result, an iterative process was completed, which resulted in an adequate measurement model to be used in the structural phase.

The SEM demonstrated acceptable model fit, and the data meet the assumption of normality. Hypotheses testing with the control variables revealed Hypotheses 1 and 2 were supported, but Hypotheses 3 and 4 were not supported. Gender and age were significant control variables, but annual income was not significant. The R^2 for the endogenous (predicted) variable, WTF, was .402 while controlling for gender, age, and annual income. The control variables were removed from the SEM, and the model was re-run. The results again indicated acceptable model fit with Hypotheses 1 and 2 supported, and Hypotheses 3 and 4 not supported. The R^2 for WTF was .379. The SEM with the control variables was selected as the final model. The next chapter provides a discussion of the results, conclusions to the study, and recommendations for future research.

Chapter V: Discussion, Conclusions, and Recommendations

The purpose of the study was to assess the influence of the four dimensions of Iso-Ahola's (1982) theory of tourism motivation on willingness to fly as a point-to-point suborbital space tourist. Fundamentally, the study examined what dimensions of tourism motivation influence willingness to fly as a point-to-point suborbital space tourist, and to what extent these dimensions influence willingness to fly as a point-to-point suborbital space tourist.

The research model for the study was developed following a literature review of tourism motivation and willingness to fly, and was based on a theory established by Iso-Ahola's (1982) theory of tourism motivation. The data was collected via Amazon's ® Mechanical Turk ® using a Google Forms ® questionnaire. Five constructs were used for the study, these were personal seeking (PS), interpersonal seeking (IS), personal escape (PE), interpersonal escape (IE), and willingness to fly (WTF). The study was controlled for gender, age, and annual income. The data were analyzed using structural equation modeling (SEM), indicating Hypotheses 1 and 2 were supported, and Hypotheses 3 and 4 were not supported. This chapter provides a discussion of the results, conclusions from these results, study limitations, and recommendations for future research.

Discussion

Demographic Results

The demographic data collected includes gender, age, ethnicity, and annual gross income, and the results were compared with the general population of the United States. As noted in the previous chapter, the percentage of male respondents (66.0%) was higher, and the percentage of female respondents (33.4%) was lower than the general population

of the United States (male = 48.0%, female = 52.0%). The gender ratio of Amazon ® Mechanical Turk ® workers varies slightly from the general population of the United States with 52.8% being male and 47.1% being female (Difallah et al., 2018). However, the results of the study have a higher percentage of male and a lower percentage of female respondents than the average ratio of Amazon ® Mechanical Turk ® workers. The ratio of male to female participants in the study is balanced with previous space tourism research, though. Although not conclusive, previous research on tourism motivation and willingness to fly alludes to males in the United States being more prone than females to participate in commercial space flight (Crouch et al., 2009; Ewert et al., 2013; Hill et al., 2015; Mehta et al., 2015; Reddy et al., 2012).

With reference to age, the groups with the most respondents were 30-39 years old (39.9%) and 18-29 years old (24.5%). The survey participants 18-29 years (24.5%), although slightly higher, is fairly consistent with the general population of the United States between 18-29 years (20.9%). The other age groups were less consistent, however. Respondents 30-39 years (39.9%) were higher than the same age group within the general population of the United States (17.3%). Oppositely, the survey participants 50 years and older (13.2%) were a substantially lower percentage than the general population of the United States (45.9%). Although age is not a conclusive determinant of tourism motivation and willingness to fly (Anania, Mehta, et al., 2018; Baugh et al., 2018; Rice & Winter, 2019; Winter & Trombley, 2019), the probability of choosing a suborbital space flight, in particular, or any space flight, in general, decreases with age (Crouch et al.,

2009; Reddy et al., 2012). The breakdown of respondents by age is consistent with this research. The percentage of young respondents was higher than the United States' population, and the percentage of older respondents was lower.

The majority of respondents replied with the ethnicity of Caucasian (White, non-Hispanic) (88.6%). It is slightly higher than the reported percentage of Caucasians in the general population of the United States (60.1%) (U.S. Census Bureau, 2021). The remaining reported ethnicities, although slightly lower, are relatively consistent with the percentage breakdown of the general population of the United States aside from Latino/Hispanic, which was only 2.2% of the respondents, but 18.5% of the United States' population.

Finally, the percentage of respondents in the study for annual gross income categories between $15,000 and $99,999 were higher than the general population of the United States. The percentage of respondents in the study for annual gross income categories less than $15,000 and greater than $100,000 were higher than the general population of the United States. Additionally, the median ($45,000) and mean ($48,600) were lower for study respondents compared to the general population of the United States ($67,521 and $97,026, respectively). Interestingly, income was not significant as a control variable in the study.

Model Results

The model used in the study contained four exogenous variables and one endogenous variable. The four exogenous variables were from tourism motivation (PS, IS, PE, and IE), and the one endogenous variable was WTF. Gender, age, and annual income were added to the model as control variables and were treated as exogenous

variables that could influence WTF. There were four hypotheses in the model. Hypotheses 1 and 2 were supported. Hypotheses 3 and 4 were not supported. Hypothesis 3 was statistically significant; however, the results were opposite the hypothesized direction. The model with the control variables was compared to a model without the control variables. Removing the control variables did not change the outcome of the hypotheses.

Personal Seeking. If a tourist's motivation is personal seeking (PS), the tourist is pursuing rest and relaxation, ego-enhancement, and/or novelty. It was hypothesized that there is a significant positive relationship between personal seeking and willingness to fly. This relationship was supported by the full structural model. This finding was expected as astronauts and potential space tourists seek adventure, prestige, pride, novelty, and fun (Ao, 2018; Baugh et al., 2018; Y.-W. Chang, 2017; Laing & Frost, 2019; Olya & Han, 2020; Reddy et al., 2012). Explicitly, Ao (2018) found astronauts were motivated by the adventure, prestige, and pride of space travel.

Similarly, Y.-W. Chang (2017) found people's attitude toward space travel was one of adventure, gratification, and experience, and this relationship was partially mediated by the novelty. Laing and Frost (2019) identified excitement, novelty, and distinction among the key motivations for space travel. Olya and Han (2020) found adventure, gratification, and desire to experience novel travel were motivation antecedents of space travel behavior intentions. The findings from the study suggest willingness to fly as a point-to-point suborbital tourist is motivated by the personal seeking dimension of the tourism motivation.

Interpersonal Seeking. If a tourist's motivation is interpersonal seeking (IS), the tourist is pursuing interaction with new people in a tourism group or location. It was hypothesized that there is a significant positive relationship between interpersonal seeking and willingness to fly. This relationship was supported by the full structural model. This finding is consistent with previous research as astronauts and potential space tourists desire the social aspect of experiencing space flight and sharing that experience through human interaction (Ao, 2018; Y.-W. Chang, 2017; Laing & Frost, 2019; Olya & Han, 2020). Specifically, Ao (2018) discovered astronauts desired meaningful human interactions by documenting and sharing their spaceflight experiences with others. Y.-W. Chang (2017) found social innovativeness significantly influenced a person's attitude toward space travel, and this relationship was partially mediated by the novelty suggesting people were motivated by being new and different when comparing themselves to those who did not experience space travel. Laing and Frost (2019) found pro-social motivation, which is sharing information about space travel with others, was a key motivation for space travel. Olya and Han (2020) discovered social motivation, defined as the motivation to socialize with friends, family, and other people with similar interests, influenced people's attitudes toward space travel. The findings from the study suggest willingness to fly as a point-to-point suborbital space tourist is motivated by the interpersonal seeking dimension of the tourism motivation.

Personal Escape. If a tourist's motivation is personal escape (PE), the tourist is evading personal concerns and difficulties. It was hypothesized that there is a significant negative relationship between personal escape and willingness to fly. This relationship was not supported by the full structural model; as the results show the relationship was

not statistically significant. Iso-Ahola's (1982) theory of tourism motivation proposed four dimensions; PE is one of these dimensions. The results indicate the PE dimension did not significantly influence willingness to fly as a point-to-point suborbital space tourist. No other space tourism research was discovered applying the theory of tourism motivation using SEM; therefore, this is the first research to report that PE was not a significant influence for space tourism. Further research should apply this scale to investigate the presence of PE in specific tourism domains as the current results suggest PE is not a significant factor in one's motivation to fly as a point-to-point suborbital space tourist. Further research can provide increased validation of the theory of tourism motivation in point-to-point suborbital space tourism, and other tourism domains.

Interpersonal Escape. If a tourist's motivation is interpersonal escape (IE), the tourist is evading friends, family, and/or co-workers. It was hypothesized that there is a significant negative relationship between interpersonal escape and willingness to fly. This relationship was not supported by the full structural model as the results show a significant positive relationship between IE and WTF. The finding is noteworthy as it suggests willingness to fly as a point-to-point suborbital space tourist is motivated by the IE dimension of tourism motivation. Similar to the discussion about PE, IE is one of the dimensions of Iso-Ahola's (1982) theory of tourism motivation. However, previous space tourism motivation research did not identify the concepts of IE as positive motivators for space tourism (Ao, 2018; Y.-W. Chang, 2017; Laing & Frost, 2019; Olya & Han, 2020).

Research Questions Results. Two research questions were proposed for this study. The first research question sought to discover which of the four dimensions of tourist motivation influenced willingness to fly as a point-to-point suborbital space

tourist. The second research question sought to discover to what extent these dimensions influenced willingness to fly as a point-to-point suborbital space tourist.

The model results discussed in the previous sections provide the answer to the first research question. The model results reveal three dimensions of tourist motivation that influence willingness to fly. The answer to research question two is provided with the standardized factor loadings from the model. The dimension with the highest standardized factor loading on willingness to fly is IS with a value of .329. Next, PS exhibits a sizable standardized factor loading with a value of .210. Finally, IE has the lowest standardized factor loading on willingness to fly with a value of .142.

Hypotheses 1 and 2 were supported indicating PS and IS influence willingness to fly. PS involves a tourist pursuing rest and relaxation, ego-enhancement, and/or novelty. The significant positive result for hypothesis 1 complements previous research as astronauts and potential space tourists seek adventure, prestige, pride, novelty and fun (Ao, 2018; Baugh et al., 2018; Y.-W. Chang, 2017, Laing & Frost, 2019; Olya & Han, 2020; Reddy et al., 2012). IS involves a tourist pursuing interaction with new people in a tourism group or location. The significant positive result for hypothesis 2 complements previous research as astronauts and potential space tourists desire the social aspect of experiencing space flight and sharing that experience through human interaction (Ao, 2018; Y.-W. Chang, 2017; Laing & Frost, 2019; Olya & Han, 2020).

Hypotheses 3 was not supported; therefore, the model indicates PE does not influence willingness to fly. PE did not hold up as dimension of tourism motivation, which is dissimilar from previous research using Iso-Ahola's theory of tourism motivation (Biswas, 2008; Musselman & Winter, in press; Snepenger et al., 2006;

Thanabordeekj & Nipasuwan, 2017). However, this study differs from previous research as it assesses influence of PE on willingness to fly as a point-to-point suborbital space tourist. Hypothesis 4 was significant, but in the opposite direction than hypothesized, indicating IE influences willingness to fly. The influence of IE indicates this dimension significantly influenced willingness to fly as a point-to-point suborbital space tourist, but to a lower extent than PS and IS. It is possible that, although not a strong motivator, people see point-to-point suborbital space travel as an opportunity to escape the people in their everyday lives. This could be supported by Laing and Frost's (2019) identification of freedom and escapism as a key motivation for space travel. They explain this as freedom gained from the pleasure of floating in space based on a hedonic motivational perspective while, paradoxically, recognizing in space travel there is still a considerable amount of control by others. Said differently, IE may have influence on WTF because it is partially seen as a freeing experience (and escape from the stress of others), but with less influence because tourists recognize the experience has considerable controls in place (and therefore less freedom to choose one's own experience).

Control Variables. Although not conclusive, and in some cases scant, previous research shows age, gender, and income can influence motivation and willingness to fly as a point-to-point suborbital space tourist. Therefore, age, gender, and annual gross income were included as control variables in the model. The results indicate a significant negative relationship between age and WTF, and gender and WTF. There is research that demonstrates willingness to participate in a space flight decreases with age (Crouch et al., 2009; Reddy et al., 2012), and in general, as people's age increases, they are less willing to accept new technology (Cruz-Cardenas et al., 2019; Mehta et al., 2016; Rojas-Mendez et al., 2017). Also, males from the United States tend to be more likely (Crouch et al., 2009), trusting (Hill et al., 2015), and interested (Reddy et al., 2012) to participate in space flight when compared to females from the United States. Finally, the relationship between annual gross income and WTF was not statistically significant. In the end, with the control variables removed from the model, the R^2 for the WTF only decreased from .402 to .379, a decrease of .023. The control variables appear to explain this slight change, but the results suggest the control variables did not have a significant contribution on the model.

Conclusions

The study researched the influence of personal seeking (PS), interpersonal seeking (IS), personal escape (PE), and interpersonal escape (IE) on the willingness to fly as a point-to-point suborbital space tourist. Due to the potential to influence tourism motivation and willingness to fly, age, gender, and annual gross income were added to the model as control variables.

Analysis of the results presented in Chapter IV and the previous discussion reveals, in order of effect size, IS, PS, and IE influence WTF as a point-to-point suborbital space tourist. Iso-Ahola's (1982) original *theory of tourism motivation* proposed tourism has two motivational forces: *seeking* and *escaping*. A person may seek to visit a location or engage in a leisure activity that produces satisfaction, or escape a current environment for a location or leisure activity that produces satisfaction. The results of the study suggest *seeking* is predominant within these dialectic motivational forces as IS and PS had the greatest standardized factor loadings on willingness to fly. Additionally, the theory also applies a personal or interpersonal dimension. The results suggest interpersonal as the predominant dimension as PE did not have a statistically significant influence on willingness to fly, and IS and IE did. The control variable annual gross income did not have a statistically significant effect on willingness to fly. Age and gender did have slightly negative significant effects on willingness to fly, but were not significant contributors to the final model.

The study created a model to assess tourists' motivation toward willingness to fly as a point-to-point suborbital space tourist. The theoretical and practical implications garnered from the study are discussed in the subsequent sections.

Theoretical Implications

The development of a new theoretical model is the principal contribution of the study. The theoretical model identifies three dimensions of tourism motivation that influence willingness to fly as a point-to-point suborbital space tourist. The model

demonstrated, in order of effect, interpersonal seeking, personal seeking, and interpersonal escape explain 40% of the variance in willingness to fly as a point-to-point suborbital space tourist.

The study contributed to the body of knowledge by extending the use of Iso-Ahola's (1982) theory of tourism motivation to assess the influence on willingness to fly as a point-to-point suborbital space tourist. Additionally, it builds upon Musselman and Winter (in press) and suggests further research is needed to understand how the model applies to point-to-point suborbital space tourism. The study ultimately supports previous recommendations for more empirical studies to expand the conversation about space tourism, and provides a model for application in future space tourism research (Laing & Frost, 2019; Zhang & Wang, 2020). The study also expanded the body of knowledge for use of the willingness to fly scale as this is the first known study to use the willingness to fly scale in reference to point-to-point suborbital space tourism.

Finally, the study contributed to the body of knowledge by controlling for age, gender, and annual gross income when assessing the influence of the dimensions of tourism motivation on the willingness to fly. The control variable annual gross income did not have a statistically significant effect on willingness to fly. Age and gender did have a slightly negative significant effect on willingness to fly, but were not significant contributors to the final model.

Practical Implications

To date, the only commercial suborbital space flights have occurred in the United States (Foust, 2021a, 2021b). However, only one empirical research study assessing the motivations of space travelers from the United States was discovered (Olya & Han,

2020). The current research established a baseline for participants' tourism motivation and willingness to fly as a point-to-point suborbital space tourist. Additionally, the development of this new theoretical model provides a baseline to assess the influence of other contributing factors, such as individual culture and personality, on tourism motivation and willingness to fly as a point-to-point suborbital space tourist. These results are essential as space tourism is primarily a consumer-oriented field and the results of the study allow for solutions to challenges associated with this consumer-oriented field. The results of the study ultimately provide validated data for target marketing to policymakers and potential point-to-point space tourists and investors.

Limitations of the Findings

This section reviews the limitations of the study. First, with the use of Amazon ® Mechanical Turk ®, a convenience sampling strategy may introduce selection bias. The participants decided to participate based on the title and explanation of the survey, payment for survey completion, the perceived survey completion time, and other potential motivational factors. Prior research shows, though, that Amazon ® Mechanical Turk ® provides results similar to laboratory or offline studies (Buhrmester et al., 2011; Germine et al., 2012; Mason & Suri, 2012; Ramsey et al., 2016). Additionally, sampling bias was reduced through the use of a generic description of the survey so potential participants could assess the nature of the study without the survey being more or less attractive to respondents of a particular demographic or characteristic (Goodman & Paolacci, 2017).

Second, although Amazon's ® Mechanical Turk ® was seen as the most appropriate data collection process, it could be viewed as limiting the generalizability of the results. However, Amazon's ® Mechanical Turk ® does provide access to a pool of diverse participants across education, demographic and dispositional variables (Mason & Suri, 2012; Mehta et al., 2019; Sheehan, 2018), and research demonstrates equal internal and external validity when comparing online survey platforms to other convenience samples within the field of applied psychology (Walter et al., 2019). Finally, Amazon ® Mechanical Turk ® provides access to a broad population providing the opportunity to increase generalizability with increased external validity (Rice et al., 2017).

Third, analysis of SEM results has some inherent limitations. Because the study was a non-experimental, cross-sectional research design, the results imply correlation, but not causation, between the exogenous variables and the endogenous variable. SEM is not designed to infer cause, but to assess relationships between variables. To infer cause, common practice would be to manipulate the exogenous variables, and use an experimental design (Bagozzi & Yi, 2012; Hair et al., 2018; Trafimow, 2021). The study did not follow these practices and it would be inappropriate to report the results as causal. Additionally, the SEM model was limited to the hypothesized variables, but other variables and relationships, not investigated here, could exist (Hair et al., 2018; Trafimow, 2021). The study did not intend to explain all variables influencing the willingness to fly as a point-to-point suborbital space tourist, but to assess the influence of the four dimensions of Iso-Ahola's (1982) theory of tourism motivation on willingness to fly as a point-to-point suborbital space tourist. Future research could expand on other factors that influence willingness to fly.

Recommendations

Recommendations from this study are divided into recommendations for the space tourism industry and recommendations for future research.

Recommendations for the Space Tourism Industry

The space tourism industry should focus on the interpersonal seeking, personal seeking, and interpersonal escape dimensions of tourism motivation when developing marketing strategies for point-to-point suborbital space tourism. The results show the motivation for flying as a point-to-point suborbital space tourist was more influenced by the interpersonal seeking and personal seeking dimensions than the interpersonal escape dimension. Interpersonal seeking is about sharing the tourism experience with others at the tourism destination or those people engaged in the tourism activity. Therefore, when marketing, the space tourism industry should focus on the interactions with the people executing the point-to-point suborbital space flight, and the other participants on the space flight. These personal interactions could be accomplished within the pre-flight engagement or venue, during the flight experience, and/or post-flight engagement or venue. Additionally, the space industry should purposefully develop a means for point-to-point suborbital space tourists to document and share their spaceflight experiences with others.

The space tourism industry should also focus on PS, the personal seeking dimension by marketing the novelty of point-to-point suborbital space flight. The focus could highlight the prestige of engaging in a point-to-point suborbital space flight, and

the pride one will experience from having done so. Along with novelty, prestige, and pride, the space tourism industry should place emphasis on the adventure and fun of engaging in a point-to-point suborbital space tourism flight.

Finally, the results demonstrate a slight influence of the interpersonal escape dimension on willingness to fly. This interaction is not supported by literature, though. The space tourism industry should seek to understand if there is value in marketing evasion from friends, family, and co-workers as part of the flight experience. The research garnered from such studies would shed additional light on tourism motivation and willingness to fly as a point-to-point suborbital space tourist.

As described in the next section, the space tourism industry would also benefit from research expanded to potential tourists from other countries, and other dispositional factors, including age and gender.

Recommendations for Future Research

Musselman and Winter's (in press) modified tourism motivation operational model should be improved upon. Musselman and Winter (in press) and the pilot study showed acceptable reliability and validity. When used with the willingness to fly scale in the main study, the internal consistency reliability, convergent validity, and discriminant validity were less than desirable. Ultimately, acceptable reliability and validity were achieved; however, future research should focus on increased reliability and validity so use of the model can be expanded as described in the next paragraphs.

The model in the study explained 40% of the variance in willingness to fly as a point-to-point suborbital space tourist, but explanations for 60% of the variance remain. Future research should investigate the influence that other factors, such as curiosity and

individual culture, have on willingness to fly. In addition, a longitudinal study could be accomplished to understand how the influence on willingness to fly as a point-to-point suborbital space tourist changes over time, especially as the industry gets closer to achieving point-to-point suborbital flight.

Suborbital space flight became a reality in 2021 with launches from Virgin Galactic and Blue Origin. Conducting qualitative and quantitative research on tourism motivation and willingness to fly with the participants of these flights could expand the body of literature, and improve the understanding of tourism motivation and willingness to fly.

As control variables, age and gender were statistically significant on willingness to fly in the study. The research on the influence of age and gender toward motivation and willingness to fly is varied (Baugh et al., 2018; S.C. Chen & Shoemaker, 2014; Crouch et al., 2009; Ewert at al., 2013; Hill et al., 2015; Jönsson & Devonish, 2008; Kara & Mkwizu, 2020; Li et al., 2013; Mehta et al., 2015; Reddy et al., 2012; Winter & Trombley, 2019; Yousefi & Marzuki, 2015). Future studies should research the direct effect of age and gender on tourism motivation and willingness to fly as a point-to-point suborbital space tourist. Doing so would provide a deeper perspective into who will fly.

Lastly, the model from the study should also be expanded for use in other populations. Research shows interest in suborbital space travel from people from other countries, including China and the United Kingdom (LeGoff & Moreau, 2013; The Tauri Group, 2014). Expanding this research could bring deeper insight into the motivation and willingness to fly of various cultures and countries.

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Appendix A

Permission to Conduct Research

Embry-Riddle Aeronautical University
Application for IRB Approval
EXEMPT Determination Form

Principal Investigator: Scott Winter

Other Investigators: Brian Musselman

Role: Student **Campus:** Daytona Beach **College:** Aviation/Aeronautics

Project Title: Motivation and Willingness to fly as Point-to-Point Suborbital Space Tourist Survey

Review Board Use Only

Initial Reviewer: Teri Gabriel **Date:** 06/14/2021 **Approval #:** 21-132

Determination: Exempt

Dr. Beth Blickensderfer IRB Chair Signature: Elizabeth L. Blickensderfer Digitally signed by Elizabeth L. Blickensderfer Date: 2021.06.15 14:18:07 -04'00'

Brief Description:

This research aims to identify factors that influence tourist motivation and willingness to fly as a point-to-point suborbital space tourist. This project will include a study using a survey design. The survey will be uploaded to Google Forms, and participants will be solicited from Amazon's Mechanical Turk (MTurk) and consist of U.S. participants.

This research falls under the **EXEMPT** category as per 45 CFR 46.104:

☑ (2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (Applies to Subpart B [Pregnant Women, Human Fetuses and Neonates] and does not apply for Subpart C [Prisoners] except for research aimed at involving a broader subject population that only incidentally includes prisoners.)

EMBRY-RIDDLE
Aeronautical University
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22 December 2021

Modification of Previously Approved IRB

Campus:	Daytona Beach	College:	COA
Applicant:	Brian Musselman	Degree Level:	Doctorate
ERAU ID:	0566799	ERAU Affiliation:	Student
Project Title:	Motivation and Willingness to fly as Point-to-Point Suborbital Space Tourist Survey		
Principal Investigator:	Scott Winter		
Sumbission Date:	12/22/2021		
Beginning Date:	12/27/2021		
IRB Approval #:	21-132		

Modification of Approved IRB
APPROVAL

✓ Validated to meet the criteria for Exempt or Expedited Status.

IRB Approver Signature: *Teri Gabriel, IRB Director*

Date of Approval: January 4, 2022

Questions

1. **Change of Protocol due to**

   Revised survey/questionnaire

   Survey changed during Dissertation Proposal review and approval.

2. **Have you started the recruitment process?**

   No

3. **Have you received any complaints or experienced unanticipated problems with this project?**

   No

EMBRY-RIDDLE
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16 January 2022

Modification of Previously Approved IRB

Campus:	Daytona Beach	College:	COA
Applicant:	Brian Musselman	Degree Level:	Doctorate
ERAU ID:	0566799	ERAU Affiliation:	Student
Project Title:	Motivation and Willingness to fly as Point-to-Point Suborbital Space Tourist Survey		
Principal Investigator:	Scott Winter		
Sumbission Date:	01/16/2022		
Beginning Date:	01/19/2022		
IRB Approval #:	21-132		

Modification of Approved IRB
APPROVAL

✓ Validated to meet the criteria for Exempt or Expedited Status.

IRB Approver Signature: Teri Gabrial, IRB Director

Date of Approval: January 18, 2022

Questions

1. **Change of Protocol due to**

   Revised survey/questionnaire

   Changed the wording of 4 statements. Also, changed the wording of the statement asking gross, annual income.

2. **Have you started the recruitment process?**

   No

3. **Have you received any complaints or experienced unanticipated problems with this project?**

   No

Appendix B

Questionnaire Data Collection Device

INFORMED CONSENT
Point-to-Point Suborbital Space Flight Survey

Purpose of this Research: I am asking you to take part in a research project for the purpose of evaluating your motivation to travel via a point-to-point suborbital space flight. During this study, you will be asked to complete a brief online survey about your motivation toward point-to-point suborbital space flight. The completion of the survey will take approximately 10 minutes.

Eligibility: To be in this study, you must be a resident of the U.S., and at least 18 years of age.

Risks or discomforts: The risks of participating in this study are no greater than what is experienced in daily life.

Benefits: While there are no benefits to you as a participant, your assistance in this research will help evaluate consumer perceptions toward the use of commercial aviation for transportation.

Confidentiality of records: Your individual information will be protected in all data resulting from this study. Your responses to this survey will be anonymous. No personal information will be collected other than basic demographic descriptors. The online survey system will not save IP address or any other identifying information. In order to protect the anonymity of your responses, I will keep your responses in a password-protected file on a password-protected computer. No one other than the researcher will have access to any of the responses. Information collected as part of this research will not be used or distributed for future research studies.

Compensation: You will receive 50 cents ($0.50) of compensation for taking part in this study.

Contact: If you have any questions or would like additional information about this study, please contact Scott Winter, scott.winter@erau.edu. For any concerns or questions as a participant in this research, contact the Institutional Review Board (IRB) at 386-226-7179 or via email teri.gabriel@erau.edu.

Voluntary Participation: Your participation in this study is completely voluntary. You may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Should you wish to discontinue the research at any time, no information collected will be used.

CONSENT. By checking YES below, I certify that I am a resident of the U.S., understand the information on this form, and voluntarily agree to participate in the study.

If you do not wish to participate in the study, simply close the browser or check NO which will direct you out of the study.

Please print a copy of this form for your records. A copy of this form can also be requested from Scott Winter, scott.winter@erau.edu.

0 YES

0 NO
[page break]

Are you at least 18 years of age? (*Select one*)
- o Yes [survey continues]
- o No [survey ends]

Instructions: The survey begins with a few questions about you. Next, you will be presented with a scenario and you will then be asked some questions about that scenario. The data collection process is anonymous and your responses will remain confidential. Your participation in the study is optional and you may opt-out at any time.

We expect that it will take you approximately 10 minutes to answer all the questions [page break]

How old are you? ____

What country are you from? _____

What is your gender?
- o Male
- o Female

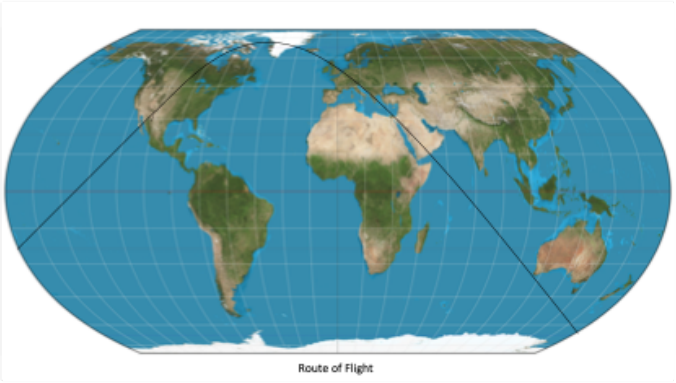
What is your ethnicity? (mark only one oval)
- o Caucasian (White, non-Hispanic)
- o Latino/Hispanic descent
- o Asian descent
- o African descent
- o Other

In US dollars, please report your annual, gross income. For example, $25,000_____

[page break]

Space tourism defined
Suborbital space flight is where the space tourist launches to an altitude higher than 100 km (62 miles). This altitude is referred to as the Karman Line, and marks the beginning of space. Current technology will have a space tourist launch from a location on earth, spend approximately 5 minutes in weightlessness and returns to a location on earth relatively close to the launch location. The next phase of suborbital space tourism is point-to-point suborbital space tourism where a space vehicle again flies above the Karman Line, but travels from one point on earth to another point of considerable distance or circumnavigates the earth. [page break]

Scenario
You will receive one day of pre-launch training the day before your flight. On the day of launch from Spaceport America in Las Cruces, NM, you will board the suborbital space vehicle. Your suborbital space flight travels around the globe flying over the midwestern United States and past the Great Lakes. The flight proceeds over southern Greenland, Ireland, England, France, Italy, Greece, Israel, Jordan and Saudi Arabia. The flight proceeds between Antarctica and Australia, and over the South Pacific before landing back at Spaceport America. This flight is provided to you free of charge (the flight does not cost you any money).


Route of Flight

For the following statements assume you participate in this flight as a tourist.

Please respond with your level of disagreement or agreement to the statements below.
SD = Strongly Disagree D = Disagree N = Neutral A = Agree. SA = Strongly Agree

[NOTE: For the questions listed below the name of the latent factor in gray text will not be visible when participant takes survey.]

Personal Escape	SD	D	N	A	SA
I feel this would help me get away from my personal environment	○	○	○	○	○
I feel this would help me escape from my everyday life	○	○	○	○	○
I feel this would result in a change in pace from my everyday life	○	○	○	○	○

Interpersonal Escape	SD	D	N	A	SA
I feel this would help me escape challenges in my social environment	○	○	○	○	○
I feel this would help me avoid interactions with others in my everyday life	○	○	○	○	○
I feel this would help me avoid others who annoy me in my everyday life	○	○	○	○	○

Personal Seeking	SD	D	N	A	SA
I feel this would increase value in myself	○	○	○	○	○
I feel this would help me increase my self-worth	○	○	○	○	○
I seek new experiences by myself	○	○	○	○	○

Interpersonal Seeking	SD	D	N	A	SA
I feel this helps me to meet new people	○	○	○	○	○
I feel this provides opportunity to be with others of similar interests	○	○	○	○	○
I feel this would allow me to participate in a novel interaction with others	○	○	○	○	○

	AGREE	DISAGREE
For this question, please select AGREE	○	○

Willingness to Fly	SD	D	N	A	SA
I would be willing to fly in this situation	○	○	○	○	○
I would be comfortable flying in this situation	○	○	○	○	○
I would have no problem flying in this situation	○	○	○	○	○
I would be happy to fly in this situation	○	○	○	○	○
I would feel safe flying in this situation	○	○	○	○	○
I have no fear of flying in this situation	○	○	○	○	○
I feel confident flying in this situation	○	○	○	○	○

Thank you for completing our survey! You are done now.
Please input your initials followed by your age. For example, if your name is John Smith and you are 23 years old, then you would put: JS23

_____

Please return to MTurk and enter this code into the appropriate place so that you can be paid for your time.