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Consumer perceptions about pilot training: An emotional response.

Timothy G. Rosser

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by

Timothy G. Rosser

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We the undersigned committee hereby approves the attached dissertation,
"Consumer perceptions about pilot training: An emotional response."
by

Timothy G. Rosser

Stephen R. Rice, Ph.D.
Associate Professor, College of Aeronautic
Graduate Program Chair
Dissertation Major Advisor

John Deaton, Ph.D.
Professor, College of Aeronautic
Committee Member

Scott R. Winter, Ph.D.
Assistant Professor, College of Aeronautics
Committee Member

Troy Nguyen, Ph.D.
Associate Professor, College of Engineering
Committee Member

Korhan Oyman, Ph.D.
Dean, College of Aeronautics

Abstract

Title: "Consumer perceptions about pilot training: An emotional response."

Author: Timothy G. Rosser

Major Advisor: Dr. Stephen Rice

Civilian pilot training has followed a traditional path for several decades. With a potential pilot shortage approaching, ICAO proposed a new paradigm in pilot training methodology called the Multi-Crew Pilot License. This new methodology puts a pilot in the cockpit of an airliner with significantly less flight time experience than the traditional methodology. The purpose of this study was to determine to what extent gender, country of origin and pilot training methodology effect an aviation consumer's willingness to fly. Additionally, this study attempted to determine what emotions mediate a consumer's decision. This study surveyed participants from India and the United States to measure their willingness to fly using the Willingness to Fly Scale shown to be valid and reliable by Rice et al. (2015). The scale uses a five point Likert-type scale. In order to determine the mediating emotions, Ekman and Friesen's (1979) universal emotions, which are happiness, surprise, fear, disgust, anger, and sadness were used. Data were analyzed using SPSS. Descriptive statistics are provided for respondent's age and willingness to fly values. An ANOVA was conducted to test the first four hypotheses and Hayes (2004, 2008) bootstrapping process was used for the mediation analysis. Results indicated a significant main effect for training, $F(1,$

972) = 227.76, $p < .001$, $\eta_p^2 = 0.190$, country of origin, $F(1, 972) = 28.86$, $p < .001$, $\eta_p^2 = 0.029$, and a two-way interaction was indicated between training and country of origin, $F(7, 972) = 46.71$, $p < .001$, $\eta_p^2 = 0.252$. Mediation analysis indicated the emotions anger, fear, happiness, and surprise mediated the relationship between training and country of origin, and training. The findings of this study are important to designers of MPL training programs and airline marketers.

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Dedication

This dissertation is dedicated to my family. First to my wife, Lynn for all your love, encouragement, patience and understanding as I worked through my Doctoral studies. Your support made it possible for me to accomplish this. There were many nights and weekends where I was locked away in the office studying, researching or writing. Thank you for being the incredible woman you are and enabling me to complete this goal.

To my daughters, Kristen and Katie. For the times you said to me “you can do this!”, and for even offering to pull an all-nighter with me when the going got a little rough. Thank you girls. I am a blessed man and I promise to never lose sight of that fact. I love you all.

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Finally, again to my wife, I would not have been able to do this without your constant love and support. Thank you. I love you.

Chapter 1

Introduction

Pilot training has followed one of two paths for many years. Pilots have pursued their flying careers by either flying in the military and receiving their training there, or completing flight training in the civilian world. The civilian path is mandated and controlled by the governing body of the state (country), in the United States, the governing body is the Federal Aviation Administration (FAA). The pilot training model used by the FAA is a prescriptive training model, that is, the FAA mandates minimum flight hours required for a pilot certificate and the skills that a pilot must master. In anticipation of a pending pilot shortage, the International Civil Aviation Organization (ICAO) created a new pilot training methodology called Multi crew License (MPL). MPL departs significantly from the prescriptive training model, rather it is a competency-based training methodology. In MPL a pilot trainee progresses, not by a prescriptive mandate, but when that trainee demonstrates that they are competent in the task being taught.

MPL has been adopted by several countries and is being used to train pilots. Since MPL was enacted there has been little research done related to it. The MPL path to pilot training places a new pilot in the cockpit of an airliner with significantly less flight time than the traditional civil pilot training path. If

aviation consumers, airline passengers, were aware of this reduced flight experience, would they be willing to fly on a flight operated by a pilot trained under MPL? What emotions would they feel about the possibility of flying on such a flight? The answers to these questions may be of value to ICAO and the airlines that are employing pilots trained under MPL.

In order to examine these questions, this study surveyed airline consumers using Amazon's ® Mechanical Turk ® (MTurk). An online survey instrument created and found to be valid and reliable (Rice et al., 2015) was used. Ekman and Friesen's (1971) universal emotions were employed in order to capture what emotions mediate an aviation consumer's willingness to fly on a flight operated by a pilot trained under MPL.

The remainder of this chapter will introduce the study to the reader. The background and purpose of the study will be presented as well as a statement of the problem. The research questions and hypotheses which guided this study are provided. The significance of the study and how it will advance scientific knowledge will be explained. The researcher will explain the rationale for the methodology and the nature of the research design. Terms that may be unfamiliar will be operationally defined, and the assumptions, limitations and delimitations will be explained. Finally the remained of the study will be described.

Background of the Study

Pilot training methodology has been following the same path for many decades. The prescriptive model of training, one that outlines minimum flight time and required skills, has been in use exclusively in civilian flight training (Hays et al., 1992). The advent of the MPL training model has been a recent addition. Because of the recency of the introduction of MPL, there does not exist much research on the subject.

The traditional path of pilot training has historically followed a prescriptive model, sometimes called lock-step (Hays et al., 1992). In this pilot training model, a pilot advances through flight training by attaining minimum flight hours. These hours are broken down into different categories including dual received, solo, day, night, cross-country (Federal Aviation Administration, 2016). Guiding the flight training process is the Practical Test Standards (PTS). The PTS describe the skills that must be developed over the course of pilot training (Federal Aviation Administration, 2011). Regardless of a pilot's ability to demonstrated mastery of any given skill in the PTS, the pilot trainee is not able to attain a pilot certificate until the prescribed hours have been met.

In the MPL training model, a competency-based training design is used. In competency-based training, learning, or performance outcomes are defined as well as assessment tools to measure the trainee's mastery of a skill (Cushing, 2013; Fiorino, 2007; Franks et al., 2014; Gonczi, 1994; Hodge, 2007; Morcke

at al., 2013). Pilot training under MPL begins with flight training in an aircraft. The time spent in the aircraft is approximately 30 hours. Once basic flight skills are developed in the aircraft, the remainder of the training occurs in flight simulators (Cushing, 2013). In the competency-based training model, once a pilot trainee demonstrates the assessed skill, they move on in training.

An area of interest in this study is the airline consumer's willingness to fly on a flight operated by a pilot trained under MPL. Aviation consumers' willingness to fly has been investigated under several different scenarios (Rice et al., 2014; Rice & Winter 2015; Rice et al., 2015). However, no research exists that examines consumer perceptions in regard to MPL. There is a plethora of research done examining pilot training, using traditional training path methodology, however, there is very little research done on MPL. Cushing (2013) completed a dissertation which took a qualitative approach to examine pilot job performance based on reviews provided by pilots who had flown with copilots trained under MPL. In the current study, gender and country of origin were examined. The purpose of including these variables in the study is to determine if these factors impact an individual's willingness to fly.

To date, there has been no research done to examine consumer's perceptions and their willingness to fly on a flight operated by a pilot trained under MPL. This study examined that issue. The intent of this study was to

measure aviation consumer's willingness to fly with a pilot trained under MPL and to identify which emotions mediate the consumers' decisions.

Statement of the Problem

Historically, airline pilots have followed a predictable, traditional training path in order to reach their career goals (Hays et al., 1992). The growth in aviation has placed a strain on the supply of qualified pilots to fill the cockpits of major airlines throughout the world. In response to this demand, some airlines have adopted a new training methodology called Multi Crew Pilot License (MPL) (Cushing, 2013). MPL uses a non-traditional training method to prepare a pilot for a career as an airline pilot. This non-traditional method includes significantly less actual flight time, replacing some of that time with simulator training (Cushing, 2013). The problem is that consumers may perceive different training methodologies as being less desirable than others.

Consumers hold opinions that can sway their choices and preferences when they are selecting a company to provide them with services. These consumer opinions represent important data points for companies to understand (Burns & Burns, 2008). Meeting the preferences of consumers can lead to increased revenues and more customers. Conversely, ignoring, or not even being aware of customer's preferences can lead to lost revenues. There is a gap in the current literature regarding aviation consumer's preference and

willingness to fly on a flight flown by pilots with different training backgrounds. Specifically, there is no data about an aviation consumer's willingness to fly on a flight flown by a pilot trained under the MPL methodology. This study seeks to begin to fill that gap.

Emotion plays a role in consumer's decision making. Marketing professionals understand this concept and design marketing campaigns to appeal to a consumer's emotions (Burns & Burns, 2008). The greeting card maker, Hallmark, understands this dynamic. This study will examine the impact emotion has on aviation consumer's willingness to fly on either a flight flown by a pilot trained in a traditional manner versus a pilot trained under the MPL methodology.

Gender differences play a role in the decisions people make. Males will be more aggressive and more willing to take a risk than will females. Males hold to typical stereotypes and portray themselves as more "macho". Females are more nurturing and protective (Feingold, 1994; Fujita et al., 1991; Slovic et al., 2005; Triandis, 1996). This study will measure the difference in willingness to fly between males and females. This information may be useful to airline marketers to portray their pilots in the best way to each gender.

Purpose of the Study

The purpose of this quantitative experimental study is to determine to what extent gender, country of origin and pilot training methodology effect an aviation consumer's willingness to fly. Additionally, this study will attempt to determine what emotions mediate a consumer's decision. Participants from India and the United States will be recruited through Amazon's ® Mechanical Turk ® (MTurk) and asked to complete the survey instruments via Fluid Surveys. The target population for this study is aviation consumers in India and the United States. Specifically, the target population is airline passengers. For the purposes of this study, the accessible population is people who have internet access and have an account for MTurk.

Because aviation consumers may perceive different pilot flight training methodologies as being more desirable than others, this study will conduct an experimental design with mediation with male and female American and Indian aviation consumers in order to determine which emotions mediate their willingness to fly based on the type of pilot flight training methodology a commercial pilot is trained under.

Research Questions and Hypotheses

The research questions and associated hypotheses that will guide this study are:

RQ1: What effect does type of training have on willingness to fly?

H_o: $X = 0$ Type of training does not have an effect on willingness to fly.

H_1: $X \neq 0$ Type of training does have an effect on willingness to fly.

RQ2: What effect does gender of the participant have on willingness to fly?

H_o: $X = 0$ Gender of the participant does not have an effect on willingness to fly.

H_2: $X \neq 0$ Gender of the participant does have an effect on willingness to fly.

RQ3: What effect does country of origin of the participant have on willingness to fly?

H_o: $X = 0$ Country of origin does not have an effect on willingness to fly.

H_3: $X \neq 0$ Country of origin does have an effect on willingness to fly.

RQ4: What interactions are present in the IVs?

H_o: $X = 0$ There are no interactions present in the IV's.

H_4: $X \neq 0$ There are interactions present in the IV's.

RQ5: Does affect mediate the relationship between the IVs and willingness to fly?

H_o: $X = 0$ Affect does not mediate the relationship between the IV's and willingness to fly.

H_5: $X \neq 0$ Affect does mediate the relationship between the IV's and willingness to fly.

RQ6: Which specific emotions mediate the relationship between the IVs and willingness to fly?

H_o: $X = 0$ There will be no specific emotions that mediate the relationship between the IVs and willingness to fly.

H_6: $X \neq 0$ There will be at least one specific emotion that mediates the relationship between the IVs and willingness to fly.

Advancing Scientific Knowledge

The Multi Crew Pilot License (MPL) was introduced by ICAO in November 2006 (Cushing, 2013). Since its introduction, it has taken some time for individual countries to adopt the training methodology and create training programs. As such, there is a dearth of research on the topic.

MPL holds at its core the concept of competency based training (CBT), that is, in MPL a pilot trainee only advances to the next skill or competency when the previous skill or competency is mastered (Cushing, 2013). In competency based training, learning or skill outcomes are produced before

training begins, and assessments to measure if an outcome has been attained are created (Hodge, 2007). Hodge (2007) explains that CBT has its theoretical origins in behaviorism and systems theory. Behaviorism is a study in understanding animal and human behavior and postulates that behavior is a result of an individual's history or experiences, reinforcement, motivation and stimuli. MPL, therefore builds on the learned experiences of a pilot trainee (Cushing, 2013) and a trainee's learning is influenced by their level of motivation (Hodge, 2007). This study is grounded in the theory of behaviorism.

The study will provide insight into how aviation consumers perceive the value of pilots trained under a competency-based methodology. The purpose of this study is to examine the aviation consumer's emotional response to the possibility of flying as a passenger on a flight operated by a pilot trained under MPL. The researcher believes that an aviation consumer will perceive MPL training as producing a pilot with less flight experience and is therefore less desirable to fly a flight on which they are a passenger.

Significance of the Study

The airline industry is experiencing a significant pilot shortage. The indications for this situation to develop had been observable for some time. In anticipation of this situation, ICAO proposed and enacted the Multi-Crew Pilot License (MPL). There may be a potential impact for airlines that employ pilots

trained under this methodology, passengers may be uncomfortable or unwilling to fly on a flight operated by a pilot trained under MPL. Rattlif and Vinod (2005) indicate that information provided by potential passengers is a viable and important source of data and that this data can be used by an airline to improve its product and its revenues.

This study is designed to examine one aspect of MPL, which is the preferences of aviation consumers. This study examined what effect gender and country of origin have on an aviation consumer's willingness to fly on a flight operated by a pilot trained under MPL. Additionally, this study sought to determine which emotions the consumers are experiencing when they consider flying on such a flight. These issues have not been previously examined in relation to MPL. Aviation consumer's willingness to fly has been examined in previous research (Rice et al., 2014; Rice & Winter 2015; Rice et al., 2015), but the question of the impact MPL has on an aviation consumer's choice has not. The mediating effect of emotion on an aviation consumer's choice has been examined (Rice & Winter, 2015), however, how emotion mediates an aviation consumer's choice regarding MPL has not. This study examined these issues.

Results of this study may be of interest to airlines which are employing pilots trained under MPL. Because customer preferences can have an impact on those customers' purchasing choices (Rattlif and Vinod, 2005), understanding how aviation consumers respond to the possibility of flying on a flight operated

by a pilot trained under MPL may hold value for such airlines. Understanding what emotions an aviation consumer is experiencing when presented with the possibility of flying on a flight with an MPL-trained pilot may provide guidance for marketing efforts of airlines that employ such pilots. To date, no research has examined these issues.

Rationale for Methodology

This study used a quantitative research method that involved statistical analysis to examine what effect, if any, gender, country of origin and type of pilot training has on a consumer's willingness to fly. This study also sought to determine if there were any interactions between any of the independent variables. Finally, this study examined the mediating effect affect, or emotion may have between the independent variable and willingness to fly and what specific emotions mediate this relationship. Within the design of this study, all of these variables were coded to numerical values. According to Moland (2014) "Quantitative research uses numerical data or data that can be counted" (p. 13). Babbie (2010) states that a quantitative methodology is appropriate when the purpose is to exam relationships among numerically expressed variables and when a researcher seeks to explain the why and how of the research questions.

According to Erickson (2011), qualitative research methods focus on observation and not numerical data. A study employing a qualitative

methodology examines the participant's perceptions and experiences. A quantitative study uses numerical data and statistical analyses to examine larger numbers of participants and randomly selected sample participants. Quantitative research seeks cause and effect relationships and makes predictions (Barham, 2014). This study employed a quantitative methodology in order to examine the interactions between the independent and dependent variables. A quantitative methodology in conjunction with the research questions addressed the problem statement of this study.

Nature of the Research Design for the Study

The purpose of this research project was to examine what influence pilot training methodology, gender of the respondent and country of origin of the respondent have on a passenger's willingness to fly, and which of the six universal emotions have a mediating effect on their willingness to fly. This study employed an experimental 3-way factorial design with two additional quasi-experimental variables which were gender and country of origin.

The sample for this research study was recruited using Amazon's ® Mechanical Turk ® (MTurk). This system provides a nonprobability convenience sample. Research published by Buhrmester, Kwang, & Gosling (2011) and Germaine, Nakayama, Duchaine, Chabris, Chatterjee, & Wilmer (2012) show that MTurk data is as reliable as data collected in a laboratory. The

sample included participants from the United States and India. By the nature of the MTurk service, the participants' identities remained anonymous; there was no way to link an individual respondent to any set of survey results.

Data for this study was collected via Amazon's MTurk service using Fluid Surveys. Upon approval of this proposal, the instrumentation was made available to the required participants by use of these online services. The instruments remained available to those with MTurk accounts until the required number of participants was reached, at which time the surveys were closed. The data was retrieved, and the file imported into SPSS.

In order to collect the required primary data from the participants, survey instruments were used. These surveys were administered using FluidSurveys online service through MTurk. Using the MTurk service, participants were asked demographic data including gender and country of origin. The participants were then provided brief descriptions of the two training methodologies (Appendix A) addressed in this study, traditional path and MPL. Next, the participants were required to correctly answer four questions about the differences between the traditional path and MPL. This was done to insure that they understood the distinctions between the two methodologies. The Willingness to Fly scale created by Rice et al. (2015) (Appendix C) was used to capture the respondent's rating of their willingness to fly based on the two pilot training methodology scenarios. The scale consists of

seven statements with which they rate their willingness to fly. The scale uses a Likert-type scale of strongly disagree (-2) to strongly agree (+2) with a choice of zero as neutral. Likert-type scales are appropriate in this study because they have been found to provide valid results in both parametric and non-parametric test. (Murray, 2013). This scale has been shown to be valid and reliable in previous research. Examples of the statements on this scale include*, I would be comfortable flying with this pilot*, and *I have no fear flying with this pilot*.

Next, participants were provided the pilot training scenarios and asked to report their feelings towards the scenarios using Ekman and Friesen's (1971) universal emotions. In order to measure the respondent's emotional response to the scenarios, they were shown images of the six universal emotions (Figure B) in random order and asked "Based on the scenario above, how strongly do you feel like the image shown?" Participants manipulated a slider with their computer mouse. The slider scale had scale ends of "I do not feel this way at all" to "I extremely feel this way". The scores ranged from 0 to 100, though the participants were not aware of this score scale.

Definition of Terms

The following terms were used in this study and are operationally defined below.

Ab Initio. Ab Initio is a Latin term meaning "from the beginning" and is a term used to indicate a flight training path that moves from a pilot having no flight experience to a pilot position working for an airline (Cushing, 2013).

Affect. In the context of this study, Affect means feeling or emotion. According to Hogg et al., 2010, affect is a part of the process of an organism's reaction to stimuli.

Airline Transport Pilot Certificate. An Airline Transport Pilot Certificate is the pilot certificate that is required by the FAA in order for a pilot to be hired by a US airline and fly an airline flight (FAA Part 61, 2016). It is the highest level of pilot certificate one can attain.

Behaviorism. According to Skinner (1976), Behaviorism is the study of human and animal behavior. The theory posits that behavior is the result of an individual's environmental factors.

Certified Flight Instructor Certificate. A Certified Flight Instructor Certificate is a pilot certificate that is attained after the commercial pilot certificate and allows the holder to provide flight instruction (FAA Part 61, 2016).

Commercial Pilot Certificate. A Commercial Pilot Certificate is a pilot certificate that is attained after the private pilot certificate and allows the holder to receive compensation to act as a pilot (FAA Part 61, 2016).

Competency-Based Training. In the context of this study, Competency-Based Training means "training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards" (ICAO, 2006, p. 1-1).

Country of Origin. In the context of this study, Country of Origin means a legal resident of either India or the United States.

Gender. In the context of this study, gender means male or female.

Full Flight Simulator. A Full Flight Simulator (FFS) is "a replica of a specific type; or make, model, and series aircraft cockpit. It includes the assemblage of equipment and computer programs necessary to represent aircraft operations in ground and flight conditions, a visual system providing an out-of-the-cockpit view, a system that provides cues at least equivalent to those of a three-degree-of-freedom motion system, and has the full range of capabilities of the systems installed in the device" (FAA Part 1, 2016).

Flight Training Device. According to the FAA, a flight training device (FTD) means "a replica of aircraft instruments, equipment, panels, and controls in an open flight deck area or an enclosed aircraft cockpit replica. It includes the equipment and computer programs necessary to represent aircraft (or set of

aircraft) operations in ground and flight conditions having the full range of capabilities of the systems installed in the device" (FAA Part 1, 2016).

Multi-Crew Pilot License. A Multi-Crew Pilot License is a pilot certificate promulgated by ICAO and regulated by a specific state (country). It allows the holder to act as a First Officer (co-pilot) at a major airline in a specific aircraft type, either the Boeing 737 or the Airbus A-320. A First Officer who has received an MPL will have 240 hours of flight experience in aircraft and flight simulators (Cushing, 2013).

Private Pilot Certificate. A private Pilot Certificate is a pilot certificate which allows the holder to fly for recreation or business, but cannot receive compensation for that flying (FAA Part 61, 2016).

Regional Airline. A regional airline is one that operates aircraft smaller than a major airline. Its route structure is usually more regional in nature. Regional airlines typically provide passenger feed to major airlines through hub airports (Wensveen, 2011).

Systems Theory. According to Hodge (2007), Systems Theory is an interdisciplinary study of systems which seeks to discern patterns and principles. Of particular interest is self-regulating systems, those which are self-correcting by the use of feedback. Such systems are found in nature as in physiological systems of the human body. Of particular application to this study

is the examination of the human learning process; how a teaching or training system effects student learning.

Traditional Pilot Training Path. In the context of this study, Traditional Pilot Training Path means a sequence of steps that lead to a pilot being fully qualified to be hired by a major airline. IT includes beginning flight training towards a Private Pilot Certificate, attaining the Commercial Pilot and Certified Flight Instructor Certificates and then building flight time experience working as a flight instructor (Cushing, 2013).

Universal Emotions. In the context of this study, Universal Emotions means the six human emotions identified by Ekman and Friesen (1971), which are happiness, sadness, anger, fear, surprise, and disgust. These emotions were found to be recognized by all humans regardless of cultural or ethnic background.

Willingness to Fly. In the context of this study, Willingness to Fly means a measurement scale created by Rice et al. (2015) which measure a respondent's willingness to fly as a passenger on a given airline flight.

Assumptions, Limitations and Delimitations

Assumptions. It is assumed that participants answered the survey instruments truthfully and honestly. The participants chose to engage in the surveys and had the option to discontinue the surveys at any time. The participants will

remain anonymous and their confidentiality will be maintained. It is assumed that the survey instruments are valid and reliable. Rice et al. (2015) showed that the Willingness to Fly Scale was both valid and reliable.

Limitations. Research studies are impacted by limitations. Limitations can come from multiple sources and while they cannot be eliminated they need to be acknowledged. Limitations are those things which are beyond the researcher's ability to control. Creswell (2005) stated that identifying limitations inherent in a study determines the parameters of that study. The first limitation with this study is a matter of generalizability. Because a convenience sample taken from Indian and American users of Amazon's MTurk was used, the results of this study can only be generalized to individuals from those countries who were online at the time the surveys were active. The sampling strategy employed in this study will limit the generalizability to any larger population.

The second limitation associated with this study has to do with the aviation backgrounds of the participants. There is the possibility that some number of the participants were not aviation consumers. If this is the case, the scenarios were strictly theoretical for them; they would have had no practical experience on an airline flight.

Delimitations. Delimitations represent choices made by the researcher which can have an impact on the results of the study. Delimitations are things the research did or did not do; these are within the control of the researcher. One

delimitations in this study was the problem itself. In this study, the effect of training methodology on an aviation consumer's willingness to fly was chosen. There are other areas associated with willingness to fly which could have been addressed. Pilot training methodology was chosen because of the lack of research in this area, particularly for MPL. Another delimitation is the sample. Only participants from India or the United States were recruited. These two countries were selected for their different cultures. The differences between an individualistic culture, like India, and a collectivistic culture, like the United States, may provide additional insight into the factors that affect an individual's willingness to fly. Another possible delimitation were the instruments being used in this study. The scenarios prepared for the study may be either confusing to the participants, or they may introduce some unintended bias. The willingness to fly scale, while shown to be valid and reliable may contain some flaws that could cause confusion for the respondents. Finally, the six universal emotions do not receive universal acceptance; there is some disagreement in the literature if these six emotions are truly universal. In the researcher's opinion, the research on the six universal emotions is compelling and demonstrate that Ekman and Friesen's (1971) work has captured a phenomena that is adequately universal.

Summary and Organization of the Remainder of the Study

Chapter 1 of this proposal provides an introduction to pilot training methodologies and consumer perceptions of those methodologies. The Multi-

Crew Pilot License was introduced as was the need to examine aviation consumers' willingness to fly on a flight flown pilot a pilot trained under MPL. Discussed in this chapter was the background of the study in order to provide the reader with an understanding of the underlying issues which lead to the need for the study. The problem statement was presented in order to clearly identify the problem that the study will hopefully address. The purpose of the study and the research questions and hypotheses were presented. These provide the reader with an understanding of what the researcher hopes to accomplish with the study and the hypotheses the researcher is examining. A research study such as this will hopefully add to the base of knowledge and be of some significance. These issues were addressed in this chapter. The rationale of the study and the research design were explained in order to provide the reader with an understanding of why this particular method and design are being employed. Terms that may be unfamiliar to the reader were operationally defined and a discussion of assumptions, limitations and delimitations was provided. Chapter 2 introduces the literature that is pertinent to this study. The literature review provides the reader with an understanding of research that has been completed that relates to issues contained within this study. Chapter 3 describes the methodology employed in this study. Chapter 4 will describe the findings and results of the study. Finally, chapter 5 will present a summary of the study to

include conclusions reached as a result of the findings. This chapter will conclude with recommendations for further study.

Chapter 2

Literature Review

Introduction

In Chapter 2 I examine the literature pertaining to training and that which addressed the different pilot flight training methodologies being used, issues in gender and ethnicities, affect, universal emotions and an aviation consumer's willingness to fly. I use Federal Aviation Administration (FAA) regulations and advisory circulars, International Civil Aviation Organization (ICAO) documents, peer-reviewed journal articles, and textbooks. I compare and contrast FAA and ICAO standards for pilot training as well as discuss pertinent issues related to gender and ethnicity as they relate to aviation consumers' willingness to fly.

Civilian pilots seeking a career as an airline pilot have followed a traditional training path in order to realize these goals. Pilot training would begin with pursuit of a Private Pilot's Certificate, followed by the addition of an Instrument Rating. The next goal would be to complete a Commercial Pilot Certificate with the addition of a Multi-Engine Rating. These would be the most basic requirements for employment as a pilot. The Federal Aviation Administration (FAA) dictates that in order for an applicant to be eligible for the Commercial Pilot Certificate, that applicant would need to have flown a minimum of 250 hours in an airplane.

This traditional path to an airline position would also require building flight experience. This is usually accomplished by working as a Certified Flight Instructor for some period of time in order to accumulate approximately 1,000 hours of flight time. The entry-level airline pilot position is that of a first officer (co-pilot) at a regional airline. A pilot would fly for the regional airline for a number of years before being hired by a major airline.

The Multi-Crew Pilot License (MPL) was originated by the International Civil Aviation Organization (ICAO) in an attempt to address the pilot shortage being experienced in the worldwide aviation industry. MPL is an airline and aircraft specific airline pilot training methodology that trains a pilot candidate from zero flight experience. A Multi-Crew Pilot License is issued to a First Officer for a specific aircraft, either a Boeing 737 or an Airbus Industries A320. The pilot trainee first completes classroom instruction, then receives training in aircraft-specific simulators, culminating with 12 takeoffs and landings in the aircraft. Once this training is complete the pilot begins flying passengers for the major airline.

Gender differences exist, yet they exist for different reasons. An examination of the literature as it pertains to gender is appropriate in this study as gender is one independent variable. Also, ethnicities are examined as it is important to begin to understand the effect that the country of origin of a consumer of airline travel, may have on their willingness to fly.

Emotions, or affect is reviewed in the literature. Past studies in many fields have demonstrated the impact affect makes on people's decision making. In this study Ekman and Friesen's six universal emotions will be used in order to determine how these emotions mediate in consumer's responses to their decision to fly. Finally, willingness to fly is examined. As the dependent variable, the previous factors will be investigated in order to determine what effect they have on a consumer's willingness to fly with a pilot produced by differing training methodologies.

Training

Training is defined as "the process by which someone is taught the skills that are needed for an art, profession, or job" (Merriam-Webster, 2015). Training takes many different forms and animals as well as humans can be trained (Kraiger, Ford, & Salas, 1993). Outcome based or competency based training (CBT) involves the identification of specific, measurable outcomes and the assessment of the effectiveness of training to attain those outcomes (Morcke, Dorman, & Eika, 2013). CBT is rooted in behaviorism and systems theory (Hodge, 2007).

A review of the literature demonstrates that the concept referred to as competency-based training (CBT) (Franks, Hay, & Mavin, 2014, Todd & Thomas, 2013, Hodge, 2007) is synonymous with the terms competency-based

education, outcome-based education (Morcke et al., 2013), outcome-based training, and vocational education and training (Delamare Le Deist & Winterton, 2005). Within the literature, all these terms share the common characteristics of defined, measurable learning outcomes, assessment, working on clear component parts of a task or skill instead of a whole or larger ability, and advancement at the learners own pace (Franks, Hay, & Mavin, 2014, Todd & Thomas, 2013, Hodge, 2007, Morcke et al., 2013, Delamare Le Deist & Winterton, 2005).

The launch of the first artificial satellite, Sputnik I, by the Soviet Union in 1957 polarized the United States and led to the realization that the US had fallen behind in the space race (Morcke, Dorman, & Eika, 2013, Hodge, 2007). The educational system of the day was held accountable for this perceived failure. This led to the federal government intervening in education and training and spending large sums of money to improve these systems (Morcke, et al., 2013). What developed was competency based training.

At the time of the development of CBT, the view was that there were fundamental problems with the existing educational system in the United States. One of the results of the steps taken by the government was the Performance-Based Teacher Education movement. This movement developed the theory of education which developed CBT (Hodge, 2007).

Hodge (2007) describes the societal and theoretical origins of CBT. The author points to the influence the Sputnik launch had on the development of CBT. The Soviet Union's accomplishment led to a deep review of the education and training system in the US. The thinking was that if the Soviet technology was more advanced than the United States', the failing rests on the foundation of that technology, the education system. The author continues that "Sputnik served to legitimize and operationalize a federal role in education" (Hodge, 2007, p.183). Federal steps went so far as Congress passing the National Defense Education Act in 1958. This Act cites national security as the need to develop the "mental resources and technical skills of its young men and women" (Hodge, 2007, p.183). Through the 1950's, 60's and 70's the US federal government directed curricular development in sciences and vocational education programs. The development of CBT gained significant financial support from the government (Hodge, 2007).

Another impetus in the development of CBT was the high level of secondary school dropouts and the difficulties graduates had in gaining and retaining employment in the early 1960's. This situation led to President Kennedy convening a national panel to examine vocational programs. As a result, the Vocational Education Act of 1963 was enacted. This Act changed the conceptions of work and helped to develop vocational education institutions (Hodge, 2007).

Another area identified as a societal influence in the development of CBT was the quality of teacher education and preparation. The primary critique was that teacher education curricula were not grounded in real-world work requirements, and that outcomes were not identified and measured. In response to these critiques, the US government enacted the Elementary and Secondary Education Act in 1965 with the goal of improving teacher education programs (Hodge, 2007).

In response to the Elementary and Secondary Education Act, the United States Office of Education's (USOE) National Center for Educational Research solicited bids to develop elementary teacher education models. In the solicitation, a requirement was that the models include "behavioral objectives and system analysis" (Hodge, 2007, p. 184). The models produced included specific competencies to be learned, instruction separated into modules, assessment and critique, and real-world field experience. These components are foundational to modern-day CBT (Hodge, 2007).

In the wake of the Elementary Teacher Education Models program of the USOE, the office began the Performance-Based Teacher Education (PBTE) movement. The American Association of Colleges for Teacher Education (AACTE) formed a committee to examine and develop PBTE. One result of this committee was the development of essential characteristics of a PBTE program. These characteristics were:

1. Competencies (knowledge, skills, behaviors) to be demonstrated by the student are derived from explicit conceptions of teacher roles, stated so as to make possible assessment of a student's behavior in relation to specific competencies, and made public in advance;
2. Criteria to be employed in assessing competencies are based upon, and in harmony with, specified competencies, explicit in stating expected levels of mastery under specified conditions, and made public in advance;
3. Assessment of the student's competency uses performance as the primary source of evidence, takes into account evidence of the student's knowledge relevant to planning for, analyzing, interpreting, or evaluating situations or behavior, and strives for objectivity;
4. The student's rate of progress through the program is determined by demonstrated competency rather than by time or course completion;
5. The instructional program is intended to facilitate the development and evaluation of the student's achievement of competencies specified.

According to Hodge (2007), the development of these characteristics was an essential step in the development of CBT and these characteristics have stood the test of time. While many authors attempted to add to or refine the characteristics, none of these criteria were ever changed.

PBTE received criticism on a number of fronts. There were complaints that the theoretical foundation was not sound, that there was no objective

evidence supporting the success of the movement, and that PBTE programs were introduced too quickly. In spite of the criticisms, the USOE continued to support PBTE.

"By the end of the 1970's the teacher education reform movement – at this stage also referred to 'competency'-based rather than just 'performance'-based education – had matured into an orthodoxy entrenched in the majority of teacher training institutions in the United States" (Hodge, 2007, p. 188). Performance Based Teacher Education had fully developed into Competency Based Education and with that development it showed its applicability to more than just teacher education. This model was developed and used in other disciplines of education and in vocational training.

Competency based training, while developmentally influenced by societal forces, can also trace its origins to theoretical influences. The two primary theories that influenced the formation of CBT are behavioral psychology and systems theory (Morke et al., 2013, Hodge, 2007). Morke et al., (2013) discusses outcome based or competency based education (OBE) and grounds the development of CBT and OBE in behaviorism. "The theoretical orientation of early OBE was towards behaviourism as represented in the works of experimental psychologists like Watson, Pavlov, Thorndike, and Skinner, whose legacy was a focus on observable behaviours" (Morke et al., 2013, p. 852). The author states that there is a clear lineage from the behaviorist

psychology of the 1940's to contemporary CBT. The author continues that curriculum design should be developed with specific objectives. These objectives should be communicated as identifiable changes in learning that lead to changes in the behavior of the student.

Franks et al., (2014) describe CBT as behaviorist in nature. The authors cite "its emphasis on observation and measurement of human behaviour" (Franks et al., 2014, p. 133). Theorists have argued that in order to judge performance, one must observe behavior. By this, one can assess learning (Tennant, 1997). Also, at the core of CBT lie behavioral objectives, an identification of specific behaviors that must be observed prior to advancing to the next module (Franks et al., 2014).

Hodge (2007), reinforces the role behaviorism played in the development of CBT. The author explains that behaviorism has an emphasis in learning theory and that emphasis has influenced the development of and approach to CBT. Fundamental to CBT is an emphasis on competencies in behavioral terms and the assessment of those observable behaviors (Hodge, 2007).

Systems theory has also had a theoretical influence on CBT. Systems theory was first described by biologist and polymath, Ludwig von Bertalanffy in the 1930's. According to Bertalanffy (1968), a system is defined as "complex elements standing in interaction" (1968, p. 32). The author further described

systems by whether they were open or closed, by the purpose of the system, and entropy.

The idea of applying systems theory to training traces back to World War II and the military's need to quickly train large numbers of soldiers in widely varied roles. Crawford (1962), described *parent systems* as large organizations, and *operating subsystems* as parts of the system that contribute to the output of the parent system. *Personnel subsystem* and *training system* are the subsystems that support operations. The author explains that during WWII, the United States created the largest training subsystem. During the 1950's and 60's, the Cold War acted as the impetus to refine the implementation of systems theory to military training (Hodge, 2007).

A distinctive characteristic of Competency Based Training is the importance placed on the development and assessment of learning objectives. Before the design and implementation of CBT, curricula did not contain clear purpose. Too often, these curricula identified what the instructor was to do, rather than what the learner was supposed to be able to do (Hodge, 2007). Tyler (1949), stated that curricular objectives should determine curriculum design, and that these objectives should state how the student's learning would change their behavior.

While much of the early development of what is today CBT focused on teaching, it is important to note the differences between education and training.

Hodge (2007) reports that a way to differentiate between the two is the behavior sought. Training involves specific behavioral *end-products*, however, these end-products cannot be known in education. Another difference is whether the experience produces individual differences or produces uniformity. Hodge (2007) states, "training aims to teach individuals to perform similar behaviors, whilst education seeks to develop behaviours in the individual that are singular" (Hodge, 2007, p. 197). The author continues that training is supported by the *parent system* to develop the human parts of that system, yet education is supported by the individual.

Another important distinction to make refers to the definitions of competence and competency. According to Delamare Le Deist & Winterton (2005), competence describes areas of functionality whereas competency describes behaviors. Kirschner (2002) supports Le Deist and Winterton as the author defines competency as "the ability to operate in ill-defined and ever-changing environments, to deal with non-routine and abstract work processes, to handle decisions and responsibilities, to work in groups, to understand dynamic systems, and to operate within expanding geographical and time horizons" (Kirschner, 2002, p.2). The author further explains that competencies are the abilities that allow learners to acknowledge and define problems in their area of operation.

During the tensions of the Cold War, the US military focused on the creation of *man-machine* systems. Theorists of the time differentiated between the development of machine systems and the human component (Hodge, 2007). These theorists identified human component requirements including task description, task analysis, training, and performance measures. Miller (1962) equates learning objective with *task description* and describes the characteristics of *good* task description. Miller (1962) describes the importance of expected responses to stimuli, responses to unusual situations such as equipment failure. These examples mirror the learning objectives used in CBT. "Miller's analysis of task description requirements has been a pivotal influence on the way competency standards are structured and expressed within contemporary CBT" (Hodge, 2007, p. 199).

As CBT has developed, it has been applied to several professions, examples include law, medicine, and aviation. Gonczi (1994) has described the benefits of CBT in professional training. However, CBT has remained a tool used primarily in vocational training (Todd & Thomas, 2013). In 1999, the Australian Civil Aviation Safety Authority mandated the inclusion of competency based training methods for private and commercial pilot training. The inclusion of pilot training followed the Australian government's call for CBT in vocational and workplace training in the 1980's (Franks, Hay, & Mavin, 2014). According to Franks et al., (2014), the inclusion of CBT in

Australian flight training provides "a convenient means for codifying flying skills for the purpose of standardizing and regulating flying instruction and assessment at the *ab initio* level" (Franks et al., 2014, p. 133). However, a critique of CBT was voiced by the authors as they recognized that CBT promotes training to minimum acceptable levels instead of to a level of excellence. This same critique was voiced by Morcke et al. (2013), "(T)he second issue was how to promote excellence when competencies are targeted at "good enough" performance" (Morcke et al., 2013, p. 855). Franks et al. (2014) stated that CBT tends to "deemphasize the development of cognitive skills required for complex decision making during flight" (Franks et al., 2014, p. 133). The authors added that by focusing exclusively on behaviors, cognition is ignored.

Emphasis is placed on the assessment process in competency based training; it focuses on observable behavior, or what the learner does instead of what they understand. Assessment in CBT is made by comparing behavior to previously expressed, specific standards (Franks et al., 2014). These standards must be measurable, however as previously stated, they represent a minimum standard.

Competency based training has a long history and it has remained basically unchanged since its inception. Its design provides a measurable product, that is, a trainee that successfully completes all the modules in a CBT

training packet will have the expected competencies. CBT is founded on behaviorism and system theory and its heritage in these theories is well documented. CBT is not without its criticisms, but it has been effectively used in primarily vocational training.

Pilot Training

The International Civil Aviation Organization (ICAO) publishes standards which outline the principles and techniques of air navigation and operations. Each State, or country then produces specific procedures and criteria for all aspects of aviation. According to Cushing (2013), "The criteria for licensing pilots are defined by each State's aviation regulator, e.g. the Federal Aviation Administration in the United States, the Civil Aviation Authority in the United Kingdom, the Civil Aviation Safety Authority in Australia, Transport Canada; the criteria follow the standards developed at the ICAO Conference in Chicago, 1944" (p. 3). A review of pilot training is appropriate in this literature review as the proposed research will consider the effect of the type of pilot training has on the respondents' willingness to fly.

Pilot training and certification in the United States is regulated by the Federal Aviation Administration (FAA). The FAA uses a criterion-based training methodology where pilot tasks and competencies are prescribed in the Code of Federal Regulations (CFR). The pilot training methodology in the US uses the classroom, simulators, and aircraft. In addition to tasks and

competencies, the FAA also requires minimum flight time experience of a pilot trainee, in order to be eligible for the practical examination for a given pilot certificate or rating. According to Beutler (1972), "flight training programs are subject to Federal regulations which prescribe course content, time-in-training, acceptable training aids and equipment, and quality control through checks given pilots at the end of training" (p. 129).

Civilian pilot training in the United States, typically begins with a pilot applicant pursuing a Private Pilot Certificate. Following completion of the Private Pilot Certificate, an aspiring pilot then adds an Instrument Rating. After additional flight and ground training, a pilot applicant will attain the Commercial Pilot Certificate and then add a Multi-Engine Rating. Practical flight examinations for all of the above pilot certificates and ratings are conducted according to the Practical Test Standard (PTS). The PTS outline Areas of Operation, Tasks, and Objectives. These criteria describe "the conditions under which competency must be demonstrated, and acceptable performance standards, which the pilot must satisfy (Cushing, 2013, p.25).

Public Law 111-216 was enacted August 1, 2010 which addressed multiple issues related to airline safety. Titled Aviation Safety and Federal Aviation Administration Extension Act of 2010, it required the FAA to address issues of, among others, pilot training records, pilot fatigue, flight crewmember

screening and qualifications, and airline transport pilot certification (PL111-216, 2010).

Public Law 111-216 led to changes to the FAA's regulations regarding, among others, the certification or licensure of airline pilots. Historically, a pilot could be hired by a regional airline with a Commercial Pilot Certificate which requires a minimum of 250 flight hours. The new regulations enacted in response to PL111-216 now require that any pilot hired by any airline must hold an Airline Transport Pilot Certificate which requires a minimum of 1,500 flight hours (FAA, 2013).

In order to be eligible to be hired as a pilot at an airline, he or she must build flight experience. Due to changes in US Federal law, a pilot hired by an airline must hold an Airline Transport Pilot (ATP) Certificate. Historically, the ATP required a minimum of 1,500 flight hours in order to be eligible for the practical exam, however, recent changes to the Federal Aviation Regulations (FAR's) allow a pilot applicant to be eligible for a Restricted ATP with reduced flight hours. For a graduate of a collegiate aviation degree program which has been approved by the FAA, only 1,000 hours are required for the Restricted ATP. The majority of pilot applicants attain these required hours by working as a Certified Flight Instructor (CFI). The CFI certificate is attained after completion of the Commercial Pilot Certificate.

A Certified Flight Instructor provides the flight and ground training an applicant requires in order to be eligible for a pilot certificate or rating. All flight time spent in an aircraft with a student, regardless if the Flight Instructor is manipulating the flight controls, is logged towards the 1,000 or 1,500 hour minimum requirement for the ATP.

According to Airline Pilots Association, International (2014), the majority of new airline pilots begin their career at a regional airline. Regional airlines typically fly smaller jet or turboprop aircraft on shorter routes. These airlines enhance the air travel service a major airline provides by flying to smaller communities that do not provide adequate passenger loads to justify a larger aircraft. The regional airlines carry their passengers to a larger hub airport where a partner major airline provides service on longer routes (Wensveen, 2011).

Casner, Geven, & Williams (2013) conducted a research project to examine the effectiveness of airline pilot training for abnormal events. The researcher provided 18 airline pilots with an abnormal event during a flight in a level D Boeing 747-400 flight simulator. Of the 18 pilots, 9 were captains and 9 were first officers. The participant's flight time varied from 5,000 to 20,000 hours (M = 11,056 hours, SD = 3,670). The 18 pilots were all presented with the same three abnormal events. These events are standard events that are required by federal regulation to be practiced during airline training. The three events

were a) aerodynamic stall, b) low-level wind shear, and c) an engine failure at takeoff. The abnormal events were presented to the pilots in two alternate ways. The events were presented under circumstances typical during an airline training period, and in unexpected circumstances.

The procedure used by the researchers entailed meeting with the pilots prior to the simulated flight. The participants were told that they would practice events that would normally be practiced during a training flight. The pilots were assured that the researchers were evaluating training and testing, not the skills of the pilots. The pilots then flew the training mission and experienced the abnormal events presented in the two different circumstances.

In order to introduce control conditions, the pilots were tasked with dealing with the abnormal events as they would in any simulator training session. The treatments occurred in ways that were not typical in these training environments, but could be experienced in real-world conditions. To measure performance in the stall scenario, the researchers measured the time it took the pilots to apply full engine power. In the low-level wind shear scenario, the researchers measured the time it took the pilots to apply full power and the total altitude lost. In the engine failure on takeoff scenario, the researchers examined if the pilots made the correct go/no-go decision and how well they controlled the lateral movement of the aircraft.

The results indicated that the pilots performed worse in the unexpected events than the typical circumstances. In the stall scenario, the control throttle response time was short (M = 1.33 seconds, SD = 0.55), however, when given no warning, the response times were much longer with greater variability (M = 11.39 seconds, SD = 5.05). Two pilots never responded properly by applying full power. In the low-level wind shear scenario, the expected event produced a throttle response time (M = 7.7, SD = 2.2) yet for the unexpected scenario, (M = 9.8, SD = 4.6). A paired t test comparing the two response times showed no significant difference. In the engine failure scenario, all the pilots maintained adequate lateral control, but two pilots made a significant mistake by aborting the takeoff after the critical takeoff speed had been attained.

The researchers concluded from these results that "when these events were presented in the familiar ways that they were taught, practiced and tested during airline training, pilot's responses were consistent with accepted standards and varied little from pilot to pilot" (Casner et al., 2013, p. 483). However, when the pilots experienced abnormal events in a way different from the typical training environment their performance worsened and in some cases was incorrect.

Lindo, Deaton, Cain, & Lang (2012) examined training for the instrument rating with different types of flight instrument displays. The researchers sought to determine the effectiveness of transfer of training when a

pilot who had been trained with digital flight instruments transitioned to flying an airplane equipped with analog instruments and vice versa. The researchers randomly selected forty-two participants from a group of volunteers and separated them into two groups. Twenty-one of the participants had been trained using digital flight instrument displays and twenty-one had been trained using analog flight instruments. Group 1 was comprised of pilots who had been trained in aircraft equipped with analog flight instruments. Of the twenty-one members of the group, all were male, 18 held a Private Pilot certificate and three held a Commercial Pilot certificate. Group 2 consisted of pilots who had been trained in aircraft equipped with digital flight instrument displays. 20 of the group were male and one was female, 18 held a Private Pilot certificate and three held a Commercial Pilot certificate.

Participants were given a 15 minute practice session in a flight training device (FTD) equipped differently than the aircraft in which they trained; those trained with analog instruments flew the FTD equipped with digital flight instruments and those trained with digital instruments flew the FTD equipped with analog instruments. After the practice session, the participants then flew the same FTD and were tasked with performing several, basic instrument flight maneuvers and an instrument landing system (ILS) approach. Deviations from assigned airspeed, heading, altitude, localizer, and glideslope were measured.

Results indicated that pilots who were trained using analog flight instruments and flew the FTD equipped with digital flight instrument displays, performed better than those pilots who were trained using digital flight instrument displays and flew the FTD equipped with analog instruments. The researchers concluded that, "pilots do perform differently when transitioning to a display on which they have not been initially trained. This difference in performance is not favorable when transitioning from glass cockpit to steam gauge display, as is supported by the results for the dependent variables" (Lindo et al., 2012, p. 70).

MPL

In 2006, ICAO proposed a new pilot training program called Multi-crew Pilot License (MPL). MPL is intended to reduce the cost of pilot training and help meet the need for a potential pilot shortage. ICAO intends for the MPL program to become "the global standard for airline pilot training in 2010" (Fiorino, 2007, p.1). A pilot trainee who completes a MPL program would have 240 hours of instruction. Of these hours, between 60 and 120 hours would be in an airplane, the rest completed in a simulator (Sutton, 2005). This training methodology allows an applicant to bypass the Commercial Pilot Certificate and Instrument Rating and attain a *frozen* airline transport pilot license.

The training sequence in MPL consists of 240 hours of flight and simulator training which are divided into four phases. Phase one includes 60 to

120 hours of flight time and the student develops *Core flying skills*. In this phase of training, the trainee begins with ground school and then develops core flying skill in an airplane. The trainee will be introduced to crew resource management (CRM) concepts, learn VFR cross-country navigation, conduct their first solo flight and learn basic instrument flying.

The second phase of MPL training is the *basic level of competency*. In this phase, the trainee is introduced to multi-crew operations and continues training in instrument flying. "The trainee will carry out upset recoveries, IFR cross-country navigation, night flight and instrument flying" (Sutton, 2005, p. 4).

The third phase of MPL training is the intermediate level of competency. In this phase, the trainee will move to a flight simulator of a high-performance, multi-engine turbine aircraft, but it is not representative of a specific type of airplane. Instruction will continue in Crew Resource Management (CRM), abnormal events, emergencies and threats, and line-oriented flight training. In the fourth phase of training, advanced level of competency, the trainee will move to a full flight, six-axis simulator and ultimately fly 12 takeoffs and landings in the actual airplane. At the completion of this phase, the pilot receives the MPL certificate and is qualified to act as a first officer for the airline in the type aircraft.

Whereas FAA flight training is prescriptive in nature, MPL training is competency based; when a pilot applicant demonstrates competency in a task, that competency is considered mastered and the training continues, regardless of number of flight hours. Proponents of MPL cite competency based training as the means by which a pilot can attain a pilot job in less time and at lower cost (Sutton, 2005). According to Sutton (2005), competency based training in MPL will more clearly define the capabilities required in airline pilots and will improve standardization of pilots. "Competency-based training and assessments are based on a systematic approach under which competencies and their standards are defined, training is based on the competencies identified as required and assessments are developed to determine whether these competences have been achieved" (Sutton, 2005, p. 3).

Cushing (2013), performed a research project which sought to investigate First Officer competency for pilots who were trained in a traditional methodology versus pilots who were trained using the MPL model. The author reports that as of the time of writing, 399 graduates of MPL training programs are flying worldwide. Because the United States does not allow MPL training for its pilots, all MPL graduates are non US pilots.

The subjects for the study were three Captains who flew for a non-US airline that hires MPL-trained First Officers. These Captains had been trained either in a traditional model or in the military. All the Captains were

experienced training center instructors. The Captains selected six First Officers. Three of the First Officers held MPL pilot license certificates and three held Commercial Pilot certificates. “Each Captain evaluated one First Officer in each category and contrasted their performance” (Cushing, 2013, p. 47).

The Captains’ flight experience ranged from 6,000 to 14,000 hours, years of employment by the airline ranged from six to 11 years. The MPL First Officer’s flight experience ranged from 250 to 880 hours. All of the MPL First Officers had been employed by the airline for six months. The traditionally trained First Officers’ flight time varied from 500 to 700 hours and they had been employed by the airline from 10 months to one year.

The researcher interviewed the Captains in order to evaluate the First Officer’s perceived competency in five areas: maneuvers, clearances, technology, Crew Resource Management, and Threat and Error Management. Additionally, the First Officers were interviewed and asked about their own perceived competency in the same five areas. Results indicated that the MPL-trained First Officers were perceived as being more competent than the traditionally trained First Officers. The author reports that “none of the Captains rated the traditionally trained First Officers as more competent than the Multi-Crew Pilot Licensed First Officers; rather the reverse was true” (Cushing, 2013, p. 90). The First Officers reported similar perceptions.

The Multi-Crew Pilot Licensed First Officers expressed confidence in their training. The traditionally trained First Officers had more reservations in the quality and quantity of their training. In each case, the pilots passed the check ride at the end of the type rating training, all having met basic competency; the difference was in the greater breadth and depth of knowledge, skills and attitude on the Multi-Crew Pilot Licensed First Officers (Cushing, 2013, p. 90).

Gender Differences

Differences between the genders have been studied and described. Gender differences, sometimes referred to as the gender gap, have been studied in different contexts and settings. Research has shown that the gender gap can change with age and in different cultural settings. Gender differences are apparent in a wide range of phenomena, from competitiveness, to emotional response, to pay scales.

Costa, Terracciano, & McCrae (2001) reported differences in personality traits between men and women. General findings showed that men are more assertive and experience less anxiety than women. The researchers explained that women are more gregarious than men and they experienced more nurturing (trust and tender mindedness) feelings than men. Feingold (1994) reported the same findings and included that no differences were found between

genders for self-esteem. The author also indicated that locus of control varied with age, but gender differences in locus of control did not appear until college age.

According to Fujita, Diener, and Sandvik (1991), Women experience more negative emotions than men, specifically, American women reported more emotional issues than American men. Campbell (1981) reported that women tend to report that they are dissatisfied with their marriage more than men. The author also stated that women report more health problems than men. The chair of the American Psychological Association Task Force on Women and Depression, Ellen McGrath as reported in Landers (1988) suggested that women's unhappiness could be caused by their social status.

The researchers conducted a research project to measure both positive and negative feelings (affect) among college students. One hundred thirty-six college students took part in the study as part of a course. The students "completed many self-report measures, gathered observer-report data, completed memory performance measures of affect intensity, and produced daily reports of their activities, experiences, and emotions over a 42-day period" (Fujita et al., 1991, p. 428). Data from 100 students (66 females) was analyzed, data from the remaining students was incomplete.

The data presented by Fujita, et al (1991) show that American women experience emotion more intensely than American men. Five of the six

intensity measures used, the women's intensity levels were more intense than the males. Their findings also showed that if a person experiences strong positive emotions, they experience strong negative emotions also. Feingold (1994) noted that temperamental gender difference studies showed that men are more assertive, aggressive and are less anxious than women.

While pay disparity exist between men and women, the gap has been shrinking (Blau & Kahn, 2000). The authors state that this disparity has existed since biblical times and cite Leviticus (27:1-4) which states that a woman is worth 30 shekels of silver while a man is worth 50. The occupations women have historically held differ from those held by men. Historically, women were found working a small number of predominantly female jobs that were low-paying. A common position held by women was administrative support to include clerical. "In the early 1970's, 53 percent of women workers were in such jobs, compared to only 15 percent of men" (Blau & Kahn, 2000 p. 4). During the same time period, only 20 percent of managerial positions were held by women. Some professions were dominated by women workers. These include nursing, kindergarten and elementary school teacher, dietician and librarian. These positions are also low-paying positions compared to male-dominated professions (Blau & Kahn, 2000).

Gneezy, Niederle and Rustichini (2001) reported that high profile jobs are predominantly filled by males and this fact is a significant factor in the

gender gap for earnings. The authors cited numerous studies which identify two reasons for males filling these jobs. The first reason focuses on differences in abilities and preferences between the genders which leads to self-selection. The second reason focuses on discrimination which leads to males and females with similar preferences and abilities, being treated differently.

Gneezy et al. ((2001) conducted a research study to measure gender differences in competitiveness. The researchers advertised on a college campus in order to get volunteer participants. The participants were randomly placed in different gender teams and given mazes to complete. Teams were comprised of mixed gender and all one gender and competed as men v. men, men v. women, mixed gender teams v. mixed gender teams. In all the competitions between teams, the participants were incentivized with monetary rewards for winning.

Results showed that males react strongly to tournament incentives, while women do not. In fact, tournaments increase the gender gap over piece rate incentives. The researchers also manipulated the experiment to include elements of risk in order to measure gender differences in risk aversion. Results indicated that women displayed a slightly higher aversion to risk than the men.

Rhodes and Pivik (2010) performed a study to measure differences in gender and age in risky driving situations. The researchers examined the effect of affect on the driver's perception of risk. The researchers recruited 913 participants via a phone survey. Five hundred four of the participants were age

16-20 and the remaining were age 25-40. The participants were asked a series of questions about their feelings towards risky driving habits.

Results of the survey indicated that "positive affect were higher for the male than female drivers ($b = .15$, $p < .0001$), whereas perceived risk was higher for female than male drivers ($b = -.24$, $p < .0001$) (Rhodes, & Pivik, 2010, p. 926). Also, male drivers reported more positive affect than female drivers and less perceived risk for the risky driving behaviors assessed. The researcher determined that the risky behaviors were attributable to risk perception and positive affect.

Feingold (1994) performed a Meta-Analysis to examine gender differences in personality. The researcher examined 68 studies which provided findings from 105 independent samples ($N = 17,729$). The analysis found that no gender difference exists for self-esteem or locus of control. Females scored higher than males for anxiety, yet showed that males scored higher for assertiveness than females.

The source of these differences has been discussed. Nolen-Hoeksman (1978) posited that gender differences may be artificially produced, be determined by biology or genetics, psychoanalytically caused, the product of sex-roles, or a result of learned helplessness. Feingold (1994) described three models that address the cause of gender differences. These models are: biological, sociocultural, and biosocial. The biological model suggests that

differences in personality reflect temperamental differences between genders. Feingold (1994) posits that gender differences observed in aggression and dominance are a result of differences in gonadal hormones. The author continued that chromosomal differences can cause an increase in depression in women. Affective illnesses are linked to mutant genes on the X chromosome. Because women have two X chromosomes, they have a higher vulnerability to these illnesses, like depression.

The sociocultural model as described by Feingold (1994) posits that "social and cultural factors directly produce gender differences in personality traits" (p. 430). In this model, gender roles dictate sex differences in social behavior. This model also holds that social and cultural norms can lead to stereotypes which lead to sex differences in personality.

In the biosocial model, it is believed that "biological and sociocultural factors are both proximal causes of gender differences" (Feingold, 1994, p. 431). Feingold states that if the genders are perceived to have different behaviors because of gender differences, then they may be treated differently. In addition, social treatment can effect personality development thereby further affecting inherent gender differences.

Ethnicities

Because the aviation industry is a global industry, applicable research must consider the impact culture, or ethnicity may have on the participants' responses. This study will measure the impact that ethnicity has on the independent variable. In order to do this, I will survey respondents from the United States and India, providing data from two distinct cultures, one Western, and one Eastern. In the event that there are differences in the responses from these two groups, this may add insight to the decisions of the travelling public.

Defining the meaning of the word culture is not an easy task (Cohen, 2009). Culture represents a rich, deep meaning of the characteristics that define an individual or group. The author reports that earlier research collected 164 definitions for culture. This diversity arises due to the many influences which effect what is considered culture. Consider "an individual who is Ashkenazic Jewish, middle class, a social psychologist, American, from Philadelphia, and now living in the Southwest. Probably all of these, as well as many other identities, can be fruitfully viewed as cultural identities" (Cohen, 2009, p. 195). Culture has been defined as "shared knowledge and mutual expectations produced, disseminated, and reproduced among a network of interacting individuals" (Grossman, Ellsworth, & Hong, 2011, p. 1). Triandis (1996) defines culture as "a pattern of shared attitudes, beliefs, categorizations, self-definitions, norms, role definitions, and values that is organized around a theme

that can be identified among those who speak a particular language, during a specific historic period, and in a definable geographic region" (p. 408).

A cultural phenomenon that impacts consumer decision-making is country of origin. According to Roth and Romeo (1992), country of origin pertains to perceived economic development level. Cordell (1992) conducted a study about this phenomena. Participants were asked to provide their perception of different products that were manufactured in different countries. The products that had been produced in industrialized countries received a more positive rating than did those from less developed countries. Respondents indicated that they thought the products from less developed countries were less qualified, unreliable, or inferior. The author posited that stereotypes expressed towards countries can extend to the products produced in those countries.

The effects of country of origin consumers' cognitive processes operate in two ways: the halo effect and the summary construct (Hong & Wyer, 1989). First, when consumers are not familiar with the product, COO [country of origin] acts as a "halo" that directly affects consumers' beliefs about these products (Ahmed, Johnson, Yang, & Fatt, 2004), which is known as the "halo effect." Second, when consumers are familiar with a product, a summary construct model operates in which consumers infer a country's image from its product information, which then indirectly influences brand attitudes. In both situations country of origin is used in the consumer decision-making process as

an indicator of risk reduction and quality and defined as an external cue (Cilingir & Basfirinci, 2014, p. 286).

Hofstede (1980, 2001), explained that a cultural distinction of Thailand, China and India was that of collectivism. When measured on Hofstede's Cultural Values Index, India scored 48 out of a possible 100 (Robbins and Judge, 2009). According to Rice et al. (2014), this score indicates that India is considered collectivist, however the culture of India may also demonstrate qualities of individualism. For comparison, Guatemala would be highly collectivist as it scored 6 on Hofstede's index. The United States scored 91 on Hofstede's Index. This score indicates that the culture of the United States is highly individualistic.

Collectivism is characterized by an interdependent view of self (Markus & Shinobu, 1991). Tsui et al. (2006) report that another characteristic of collectivistic cultures is absolute trust. Individuals from collectivist cultures will trust others without the need to question or doubt. Those from India are taught from a young age to avoid antagonizing the harmony of the society or disturbing the status quo (Mehta, 2014). Indians will not question an authority figure, rather, they will always strive to demonstrate the highest respect.

Individualistic cultures, as is the United States, are characterized by aggression and zeal, people are encouraged to stand up for their beliefs and challenge differing views (Mehta, 2014). According to Mehta et al. (2014),

People from individualistic cultures like the United States, are more concerned with themselves and their own well-being. Bochner (1994) and Kashima and Callan (1994) explain that individualistic cultures are characterized by emphasis on an individual's autonomy and independence. According to Trubisky et al. (1991) in a comparison of individualistic and collectivistic cultures, those from a collectivistic culture are more obliging and they tend to avoid confrontation, while those from an individualistic culture tend to be more confrontational.

Mehta et al. (2014) performed a research study that examined consumer perceptions regarding different factors related to flight attendants. The researcher attempted to determine, among other variables, if there would be a difference in affect and trust rating based on the country of origin of flight attendants. Three hundred eighty-four individuals from India and the United States participated in the study. One hundred thirty-five of the participants were female, there was an equal number of participants from each country. The mean age of the participants was 31.06 (SD = 7.19).

Results indicated that when considering affect, the Indian participants "had more positive feelings towards the younger flight attendants, while Americans had more positive feelings towards the older flight attendants" (Mehta et al., 2014, p.34). When examining the trust data, "the younger flight attendants were approximately equally trusted by participants from both

countries, while the older flight attendants were trusted much more by Americans than Indians" (Mehta et al., 2014, p.35). In a post hoc test, the results suggested that trust decreased when compared with age for Indians, yet the trust rating increased as a function of age for Americans.

The researchers' hypotheses indicated that there would be differences in the respondent's trust and affect ratings based on the country of origin, and the age of the flight attendant. The results of the study supported these hypotheses. In the discussion of the results, the researchers indicate that the higher trust level for older flight attendants in Americans may be due to the respondents attributing age to experience. The results for the Indian participants indicate that they trust the younger flight attendants. The results for the Indian Participants are counter to a collectivistic culture as such a culture would place more respect in and value age and experience.

Rice et al. (2014) completed a research project which examined public perceptions regarding autonomous autopilots used on commercial flights. The researchers included an element of ethnicity in the study as they differentiated between Indian and US respondents. Their hypothesis in this area was: "Indian participants would be more forgiving in their attitudes towards auto-pilots and RC pilots compared to American participants given the collectivistic tendency to trust more in something that authorities have deemed safe" (Rice et al., 2014, p.4).

There were 104 participants from the United States, of which 53 were female. Ninety-seven individuals from India participated, 33 were female. The participants were asked to read a brief scenario that outlined that either themselves, their child or their co-worker were flying on a flight that was operated by either a human pilot, a human pilot who remained on the ground and operated the flight remotely, or a fully autonomous flight. They were asked how comfortable they felt about the scenario, their level of trust for the pilot-entity, and how willing they would be to fly on such a flight.

Results indicated that all "participants were more comfortable/trusting/willing with the human pilot compared to the other two conditions" (Rice et al., 2014, p.5). Compared to the Indian participants, the US respondents were "more positive about the human pilot (*ps* < .05) except the Child condition, and much more negative about the autopilot and RC pilots (*ps* < .01)" (Rice et al., 2014, p.6). These results supported the hypothesis that Indian participants would have a more positive perception of the auto-pilot and RC scenario than Americans. The authors then discussed the impact that a collectivistic versus individualistic culture may have on these results. A characteristic of a collectivistic culture, which may explain the results of this study, includes not challenging the status quo, they do not rebel and rather, they conform.

Another possible explanation the authors present is that of uncertainty avoidance, "the extent to which a society feels threatened by uncertain and ambiguous situations and tries to avoid them" (Rice et al., 2014, p.7). The results showed that those from the United States were less likely to accept uncertainty than those from India. According to this measure, Indians are more likely to take a risk with an ambiguous outcome than Americans.

Affect

Slovic, Finucane, Peters, and MacGregor (2007) define affect as "the specific quality of "goodness" or "badness" (i) experienced as a feeling state (with or without consciousness) and (ii) demarcating a positive or negative quality of a stimulus" (p. 1333). Custers and Aartz (2005) define affect as a state of feeling. Positive affect is also referred to as pleasant affect and negative affect as unpleasant (Diener, Smith, & Fujita, 1995) and Bradburn, (1969) proposed that pleasant and unpleasant affect are independent. According to Fujita, Diener, and Sandvik (1991) affect intensity is the measure of how intensely an individual responds to an emotion-invoking stimulus.

A review of affect is appropriate in this literature review as the proposed research will consider the mediating effect affect has on consumers' decisions and their willingness to fly.

Slovic et al., (2007) examined the role affect plays in decision making. The authors establish the impact that affect has on decision. The authors explain that prior research focused on the cognitive, as opposed to the affective in decision making. They state, "images, marked by positive and negative affective feelings, guide judgment and decision making" (Slovic et al., 2007, p. 1335). The authors explain that the human experiential system is rooted in affect. While cognitive skills are used in making a decision, the decision in question requires time for thought processes. However, reliance on affect and emotion provides a "quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world" (Slovic et al., 2005, p. 35).

Slovic et al. (2007), describe the work of Damasio (1994). Damasio observed patients who had experienced some form of damage to the ventromedial frontal cortices of the brain. These injuries left the patient's basic intelligence and reasoning capabilities intact, yet rendered their ability to experience emotion inert. These patients had lost the ability to connect affective feelings with the consequences of their actions. Damasio posited that individual with such brain injuries experience a form of sociopathy that renders these individuals unable to make rational decisions. They cannot make decisions that are in their best interest.

Age and gender impact general affect. Koo, Rie and Park (2004) examined subjective well-being, a multidimensional concept, "defined as life satisfaction, presence of positive affect, and absence of negative affect" (p. 268). The authors explained that in order to best examine subjective well-being and age, it was best to look separately at positive and negative affect and overall life satisfaction.

Koo et al. (2004) report that previous research demonstrates that negative affect declines with age. This decrease occurs in both frequency and intensity. The authors cite a previous study where results showed that "negative affect decreased from age 18 until about age 60 but did not change afterwards (Koo et al., 2004, p. 268).

The authors reported that change in positive affect with age is less clear. They cite one study that found older adults reported more positive affect while other studies found either stability or decrease in positive affect. The authors acknowledge that further research is required in this area (Koo et al., 2004).

Koo et al. (2004) conducted a research project to examine the relationship between age and both positive and negative affect. The researchers also sought to find if a relationship existed between subjective well-being and age, they also wanted to find if a relationship existed between gender and subjective well-being. The researchers provided a questionnaire to 2,529 adults living in the cities of Seoul and Chunchun. The ages of the respondents ranged

from 43 to 102 years of age (mean, 67.78; SD 9.43). There were 956 male respondents and 1,573 females. Positive and negative affect were measured using the Positive and Negative Affect Scale (PANAS), and subjective well-being was measured using the Philadelphia Geriatric Center Morale Scale (PGCMS).

Results indicated that "age was a significant predictor for changes in all negative and positive affect and subjective well-being" (Koo et al., 2004, p.269). Results also showed that as age increased, negative affect increased, whereas, with an increase in age, positive affect and subjective well-being decreased. A higher level of negative affect and a lower level of positive affect were reported by females, "females also reported a lower level of overall subjective well-being" (Koo et al., 2004, p.269).

Much research has been conducted to examine if a relationship exists between positive, or pleasant affect and negative, or unpleasant affect. Diener, Smith & Fujita (1995) reported that agreement does not exist on the relationship between pleasant and unpleasant affect. The authors explain their use of the terms pleasant and unpleasant when describing affect. They state:

> "we use the terms positive and pleasant affect interchangeably. We prefer the term pleasant affect for the reasons outlined by Larsen and Diener (1992). For example, the term positive affect might erroneously lead

> to the idea that this type of emotion is morally superior or desirable. Furthermore, the term pleasant affect characterizes emotions such as joy and love with their one universal characteristic – the experience is pleasant to the individual. Similarly, we use the terms negative affect and unpleasant affect interchangeably; there are again justifications for departing from the historically popular term. Nonetheless, we use the terms positive affect and negative affect at times because these words are widely applied and understood and provide continuity with the existing literature" (Diener et al., 1992, p. 130).

The authors conducted a research project where they sought to determine if pleasant emotions are coherent across people and, if there are separable relations to the personality structure of pleasant and unpleasant affect. The researchers drew a sample of 222 college students. The students completed self-reported personality and affect scales as part of a college course they were enrolled in. Several respondents' results were omitted, leaving 212 participants, of which 112 were women and 110 were men. Data were gathered on the emotional lives of the respondents. Results showed that the positive emotions (love and joy) correlated highly, meaning that people who experience one emotion experience the other also. Similarly, the unpleasant emotions (shame,

anger, fear, and sadness) correlated highly with each other, again, showing that the unpleasant emotions are experience together.

Universal Emotions

In the current study, Ekman and Friesen's (1971) six universal emotions will be presented to the participants as a mediating variable. Therefore, it is appropriate to examine these universal emotions in this review of literature.

A hypothesis of universality of emotional expression proposes that there are six universally recognizable human emotions that span all cultures (Ekman, Sorenson, & Friesen, 1969; Ekman, Friesen, & Hagar, 1978). According to Scherer and Wallbott (1994), ancient philosophers and early psychologists recognized that, in appropriate contexts, emotions are universal across cultures. The authors cite Darwin when they state "specific expressions and psychological response patterns are rudiments of appropriate behaviors" (Scherer and Wallbott, 1994, p. 310). The authors continue that, "universalism, which posits that emotion, just like perception, cognition, or learning, is a basic mechanism of human functioning that is relatively invariant over races and cultures" (Scherer and Wallbott, 1994, p. 311). Diener, Smith, and Fujita (1995), state that researchers "have marshalled evidence suggesting that there are basic, discrete emotions. It is argued that these emotions often have their

own facial expressions, autonomic responses, and evolutionary history" (p. 131).

Research conducted by Ekman and Friesen (1971) sought to determine if there are universal emotions associated with specific, universal facial expressions. The researchers determined that six facial expressions are related to six emotions. The six emotions are happiness, sadness, anger, fear, surprise, and disgust. To conduct this research, Ekman and Friesen (1971) selected two groups of individuals from New Guinea. One group had had no interaction with Caucasians or been exposed to any Western culture, this group could not speak English. The second group had some level of interaction and exposure to Western culture and could speak English. The participants were given a scenario designed to elicit a specific emotional response. They were then shown pictures of faces representing the six emotions and asked to select the facial expression that matched the emotion they experienced from the scenario. Both groups matched the same emotions to the same facial expressions. The researcher concluded that there are universal emotions, "the results for both adults and children clearly support our hypothesis that particular facial behaviors are universally associated with particular emotions" (Ekman & Friesen, 1971, p.128).

The researchers did not expect that there would be a difference in correct responses based on gender and they did not find one. The correct

responses between male and female and children and adult were calculated and *t* tests performed. The *t* tests were found to not be significant. For the between groups analysis, no significant differences were found. "The results for the most Westernized male adults were almost exactly the same as... the least Westernized subjects" (Ekman & Friesen, 1971, p.127).

Rice et al. (2015), Performed a research study to determine what emotions mediate a person's feelings of trust towards someone with mental illness. The researchers recruited 148 (58 females) participants from the United States. Participants were provided with a short scenario describing an individual who had been chronically depressed. Respondents were asked to rate their level of trust in the depressed individual. They were then presented with mages representing the six universal emotions and asked how strongly they related to each face depicting an emotion. Results indicated that only happiness mediated between the condition and the participants' trust. In discussion about the results of the study, the researchers indicated that the feeling of happiness experienced total mediation. From the results, the researchers explained "that when a person is described as having depression, participants felt less happiness towards that person and this affected how much they trusted them" (Rice et al., N.D., p. 16).

Winter et al. (N.D.) conducted a research study to examine consumer's perceptions regarding the use of Unmanned Aerial Vehicles (UAV). One hundred and ninety-four participants (64 females) took part in the study. The

mean age of the participants was 31.52 (*SD* = 10.23). Participants were provided with a hypothetical scenario involving the use of UAV's by the local police department. One scenario entailed the UAV operating autonomously and continuously, providing video feed of the neighborhood. The second scenario, the participants were told that the UAV would operate only for a specific mission and then return to the police department. Participants were asked how they felt about the scenarios and were provided images of the universal emotions which they could rate the strength of their affinity with each particular emotion. Results indicated that emotion moderated the participant's response between the two scenarios. In the mediation analysis, results indicated that the respondents experienced disgust and fear.

The researchers had hypothesized that they may be able to identify which emotions mediate the relationship between UAV use and privacy. The researchers explained the possible reasons for the participant's feelings of disgust and fear. They explained that people may feel revulsion to the idea of being watched without their knowledge and that personal data could be collected without their knowledge or consent. The reaction of fear could be connected to a fear of the safety of UAV's flying in their neighborhood.

Rice and Winter (N.D.) completed a research study that examined airline customers' willingness to fly on an aircraft that was piloted either by humans in the cockpit, or was flown by a pilot who remained on the ground and

remotely-piloted the aircraft. The researchers sought to identify which emotions mediated the relationship between pilot configuration and the consumer's willingness to fly.

Rice and Winter (N.D.) recruited 198 (86 females) participants from the United States using a convenience sampling method. The participants were provided with two scenarios describing the pilot configuration being used for a flight on which they were a passenger. The respondents were asked how they felt using images of the six universal emotions. Results indicated that the participants preferred the human-pilot flight over the autopilot flight. When analyzing the results of the mediation, the researchers found that there were statistically significant results for anger, fear, and happiness; mediation occurred for these three emotions.

The authors explain that there exists much discussion regarding changing the configuration of our aircraft cockpits. This change is driven by several factors, including a developing pilot shortage. Such a change cannot take place without considering the reactions of the flying public, the consumer. "The current study provides evidence that consumers may not yet be ready for a completely automated cockpit, and that this negative perception of a completely automated cockpit is largely driven by emotional factors" (Rice and Winter, N.D., p. 18).

Willingness to Fly

The travelling consumer has choices when it comes to the form of transportation he or she will use, or with the airline on which he or she will fly. One factor considered in the decision making process is the consumer's willingness to fly. Are there factors that cause a consumer to be willing to fly on airline A, but not on airline B? Are there factors that cause a consumer to take a bus rather than to fly? In this study I will examine a consumer's willingness to fly given two different pilot training methodologies.

Willingness to fly has been examined in previous research. Rice et al. (2015), examined an airline consumer's willingness to fly on a flight flown by a pilot who was taking prescribed antidepressants compared to a pilot who was not. The study was completed in two parts. Part one employed 88 (34 females) participants from the United States. The mean age of the participants was 34.65 (SD = 12.32). The participants were provided two scenarios about a hypothetical flight on which they would fly as passenger. They were told that on one flight the captain was not taking any medication. In the second scenario, they were told the same, except that the captain of this flight was taking medication for depression or other maladies. The participants completed a willingness to fly questionnaire.

The questionnaire used in this study had been shown to be valid and reliable. It had been created by Rice et al. (2015). The willingness to fly scale

was developed in a five stage process that asked consumers to discriminate their willingness to fly, or to not fly. The scale uses seven statements which allow a respondent to rate their willingness to fly using a Likert-type scale.

The willingness to fly ratings for this study were lower for conditions where the pilot was using any medication, and for conditions where the pilot was taking a high dose versus a low dose of medication. The researcher's hypotheses for this study were supported by the results.

In the second part of the study, the researchers sought to determine if the willingness to fly scores were due to cognitive or emotional responses. In this part of the study, 492 (216 females) participants from the United States were recruited and asked how they felt about the different pilot-medication scenarios. The researchers hypothesized that emotion would mediate the decision making process for the respondents. The results confirmed this hypothesis demonstrating that for three of the four medications, emotion explained all of the relationship between medication and willingness to fly.

As automation improves and becomes more reliable, movement is towards pilot configurations that rely more heavily on automation, allowing for fewer pilots in the cockpit of an aircraft. Rice and Winter (2015) conducted a research study to investigate willingness to fly as it applied to different pilot configurations and they considered which emotions mediate the relationship between these variables. The researchers hypothesized that passengers would be

less willing to fly on an aircraft where there was no pilot onboard and that affect, or emotion would mediate the relationship between the pilot configuration and the respondent's willingness to fly.

The researchers conducted two studies to investigate these phenomena. In the first study, 144 (60 female) participants from the United States were recruited. The mean age of the participants was 33.10 (*SD* = 10.35). The participants were provided with two scenarios describing flying on a flight with certain pilot configurations. They were then asked how they felt about flying as a passenger on these flights. Next, they were asked to rate their willingness to fly.

The results of the first study indicated that pilot configuration impacted the affect scores. Also, the results indicated that pilot configuration impacted the respondent's willingness to fly. Finally, results showed that affect mediated the relationship between pilot configuration and willingness to fly.

In the second study, the researchers sought to determine which emotions mediated the relationship between pilot configuration and a respondent's willingness to fly. One hundred and ninety–eight (86 female) participants from the United States were recruited by convenience sampling methods. The participants were again provided with the scenarios describing flights with different pilot configuration options, but in this study they were asked to rate to

what extent pictures on universal emotions represented how they felt about the scenarios.

Results indicated that "pilot configuration had very different effects on the different emotions, as seen by the significant interaction between the pilot configuration and type of emotion. Furthermore, the six different emotions did have differential effects as mediators on the relationship between pilot configuration and willingness to fly" (Rice and Winter, 2015, p. 88). This study provided insight into the consumer's willingness to fly on a commercial flight with different pilot configuration options. It also provided information as to what factors affect the consumer's decision-making process.

At the heart of an individual's willingness to place themselves in what they perceive to be a risky situation is the concept of trust. According to Kantsperger and Kunz (2010), trust is recognized as an important mediator in customer relationship marketing. According to Nielsen (2004), for a collaborative relationship to succeed, it must be based in trust. Heyns et al. (2015) explain that trust is a choice. Trust is a factor in interpersonal interactions as well as in consumer-based decisions (Kantsperger and Kunz, 2010).

Transactional-based marketing focuses on individual transactions, where a consumer interacts with a company or product once or for only a few times. Relationship marketing is centered on developing a relationship between

the consumer and the product or company and as such can only be founded on trust (Kantsperger and Kunz, 2010).

Lee and See (2004) described issues related to trust in automation. The authors explained that "as automation becomes more prevalent, poor partnerships between people and automation will become increasingly costly and catastrophic" (p. 50). The authors describe instances when humans did not intervene when automation failed to operate properly. Pilots, trusting the automation of an Airbus Industries A-320 failed to take manual control when the autopilot crashed the airplane. The crew of a cruise ship allowed the ship to drift off course for 24 hours after an automated navigation system failed. Conversely, operators of paper mills rejected automated machinery which meant the mill operated less efficiently and at higher cost (Lee and See, 2004).

Trust can be categorized as conditional trust or unconditional trust. According to Jones and George (1998), conditional trust evolves. It grows as a result of interactions. Conditional trust is recognized as being knowledge-based, it relies on positive anticipation between parties (Jones & George, 1998; Lewicki & Bunker, 1995; Shapiro, Sheppard, & Cheraskin, 1992; Sheppard & Tuchinsky, 1996). Unconditional trust involves an element of faith "that starts when individuals abandon the pretense of suspending belief, because shared values now structure the social status and become the primary vehicle through which those individuals experience trust" (Jones & George, 1996, p. 536).

Chapter 3

Methodology

Introduction

This chapter describes the methodology that was employed in this study. The purpose of this study was to examine the impact gender, country of origin and pilot training methodology has on an aviation consumer's willingness to fly. Additionally, this study determined which of the six universal emotions act as mediators in an aviation consumer's decision. While aviation consumer's willingness to fly has been previously examined in different contexts (Rice et al., 2014, Winter et al. in press), the relationship between willingness to fly and pilot training methodology has not been examined. Additionally, there is very little research associated with the Multi-Crew Pilot License. An a priori power analysis results in the need for a minimum of 800 participants. These participants will be recruited by using Amazon's ® Mechanical Turk ® (MTurk). Use of MTurk produces a nonprobability convenience random sample.

The survey instruments used in this study was administered through Fluid Surveys. Participants were individuals from India and the United states who have an MTurk account. It is hypothesized that type of training as presented in the scenarios to the participants does have an effect on willingness to fly.

This chapter describes the methodology that was employed in this study. Included in this chapter is a description of the research problem, the hypotheses and research questions. Also included is a description of the study population and sample, power analysis and data collection method. Additionally, the research instruments are addressed, to include a discussion of data collection, and instrument validity and reliability. The dependent and independent variables are discussed along with description of limitations of this study. This chapter also provides information about the proposed methods for collecting and analyzing data. Finally, legal and ethical issues are addressed. The question that this research project is examining is how will an airline consumer's willingness to fly on a commercial airline flight be affected by their gender or country of origin, and the pilot training methodology used to train the pilot of the flight, and what emotions mediate their responses.

Statement of the Problem

Pilot training methodologies have followed a traditional, predictable, government prescribed path. Pilots have been trained by following regulations that are developed in response to ICAO Annexes. This traditional path has included training in primarily airplanes with some percentage of training completed in simulators. Pilot candidates have historically first pursued a commercial pilot certificate, which requires a minimum of 250 flight hours, and then built additional flight time in order to meet an airline's minimum hiring standard. These standards

can range from 1,000 to 2,500 hours. In response to growing demand for pilots, ICAO created the Multi-Crew Pilot License (MPL). Pilot training under MPL produces a pilot with significantly lower flight hours, with much of the flight training conducted in simulators. The problem is that consumers may perceive different training methodologies as being less desirable than others.

Consumers make their choices based on need and the perception of the product or service they are purchasing. Companies must understand the choices consumers are considering when they make their purchasing decisions and must meet the preferences of their customers. Failing to consider these preferences can lead to poor economic performance for the company. A gap exists in the current literature regarding a consumer's willingness to fly on an airline flight operated by pilots with different training backgrounds, traditional or MPL. Specifically, there is no data about an aviation consumer's willingness to fly on a flight flown by a pilot trained under the MPL methodology. This study seeks to begin to fill that gap.

Emotion, gender and country of origin have been shown to influence a consumer's purchasing choices. Marketing professionals understand these issues and design advertising campaigns to address these specific influences. This study will examine the influence emotion, gender and country of origin can have on an aviation consumer's willingness to fly on an airline flight operated by pilots with different training backgrounds. Information gathered

from this study may provide insight into aviation consumer's perception regarding different pilot training methodologies and the desirability of these different training methodologies.

Research Question(s) and Hypotheses

The research questions for this study were developed in order to determine if pilot training methodology, gender, and country of origin affect an aviation consumer's willingness to fly on flights operated by pilots with different training backgrounds. In addition, this study seeks to identify if emotion acts as a mediator, and, if so, which of the six universal emotions mediate the willingness to fly of aviation consumers. The developing pilot shortage has led to the formation of the MPL training methodology by ICAO. This pilot training methodology is used in place of the traditional training path. To date there is very little research related to MPL. The research questions and associated hypotheses that guided this study are:

RQ1: What effect does type of training have on willingness to fly?

H_o: $X = 0$ Type of training does not have an effect on willingness to fly.

H_1: $X \neq 0$ Type of training does have an effect on willingness to fly.

RQ2: What effect does gender of the participant have on willingness to fly?

H_o: $X = 0$ Gender of the participant does not have an effect on willingness to fly.

H_2: $X \neq 0$ Gender of the participant does have an effect on willingness to fly.

RQ3: What effect does country of origin of the participant have on willingness to fly?

H_o: $X = 0$ Country of origin does not have an effect on willingness to fly.

H_3: $X \neq 0$ Country of origin does have an effect on willingness to fly.

RQ4: What interactions are present in the IVs?

H_o: $X = 0$ There are no interactions present in the IV's.

H_4: $X \neq 0$ There are interactions present in the IV's.

RQ5: Does affect mediate the relationship between the IVs and willingness to fly?

H_o: $X = 0$ Affect does not mediate the relationship between the IV's and willingness to fly.

H_5: $X \neq 0$ Affect does mediate the relationship between the IV's and willingness to fly.

RQ6: Which specific emotions mediate the relationship between the IVs and willingness to fly?

H_o: $X = 0$ There will be no specific emotions that mediate the relationship between the IVs and willingness to fly.

H_6: $X \neq 0$ There will be at least one specific emotion that mediates the relationship between the IVs and willingness to fly.

Research Methodology

This research study could have been completed using either a qualitative or quantitative methodology. A qualitative methodology could be used to capture aviation consumers' feelings regarding their willingness to fly on a flight operated by pilots with different training backgrounds. However, in order to provide a measurable value, a quantitative methodology was used. A quantitative methodology uses numerical data and that data is analyzed using statistics. A qualitative methodology employs observation of subjects in their natural environment, this can lead to an interpretation of their behaviors. In this study a qualitative approach was not appropriate as it does not seek to identify perceptions and subjective experiences.

For this study, a quantitative methodology was selected as it is the most appropriate method to answer the research questions and address the hypotheses associated with the independent, dependent and moderating variables. This study

used a quantitative methodology in order to measure the relationship between the variables. A quantitative method allowed for a comparison between the two levels of each independent variable, and allowed for an analysis of the mediating variables. Data was collected using Likert-type scales. Data gathered from these scales is actually ordinal, however for analysis purposes is treated as interval data. By converting the data to interval scale, this allowed the use of statistical analysis software, specifically, SPSS. This approach provided insight into aviation consumer's willingness to fly on flights operated by pilots with different training backgrounds.

Research Design

The purpose of this research project was to examine what influence pilot training methodology, gender of the respondent and country of origin of the respondent have on a passenger's willingness to fly, and which of the six universal emotions had a mediating effect on their willingness to fly. This research project employed an experimental 3-way factorial design with two additional quasi-experimental variables which were gender and country of origin. Because this project attempted to understand the effect of two or more independent variables on one or more dependent variables, a 2x2x2 factorial design was used. In order to determine the extent to which emotion mediates the relationship between the independent and dependent variables, and which of

the six universal emotions mediate, Preacher, Rucker, and Hayes' (2007) bootstrapping model was used.

In this study, group assignment for the independent variables gender and country of origin could not be controlled. Participants were already assigned to a group based on their gender (male or female) and country of origin (India or United States). For the condition, participants were randomly assigned by MTurk. There were three between-participant independent variables with two levels each, these were gender (male or female), country of origin (India or United States) and the condition, pilot training methodology (traditional or MPL). These variables lead to a 2x2x2 or three-way ANOVA.

Because a three-way ANOVA examines multiple independent variables, unlike a *t*-test, it is the appropriate statistical analysis to use in this study. One consideration was to ensure that the three assumptions of a three-way ANOVA are satisfied. According to Gravetter and Wallnauhe (2000), the three assumptions are, they must have independent scores, the parent population should be approximately normally distributed, and there is homogeneity of variance. Homogeneity of variance means that the populations from which the samples are selected must have equal variances. If the assumptions are satisfied, particularly the normality assumption, this will be a parametric procedure.

Dependent Variable. The dependent variable in this study was the respondent's willingness to fly. In order to measure the dependent variable in

this study, the Willingness to Fly scale developed by Rice et al. (2015) was used. The scale has been shown to be valid and reliable when used to measure a respondent's willingness to fly. The scale uses a 5-point Likert-type scale, using seven questions. The 5-point Likert-type scale asks respondents to rate their responses from strongly disagree (-2) to strongly agree (+2) with a choice of zero as neutral.

Independent Variables. The independent variables in this study were nominal variables with two levels. The variables were pilot training methodology, gender, and country of origin. The two levels for each independent variable are, pilot training methodology, traditional path or Multi-Crew Pilot (MPL), gender, male or female, and country of origin, India or United States.

Mediating Variables. In this study, the mediating variables were affect, specifically, the six universal emotions described by Ekman and Friesen (1971). Respondents were asked to rate their emotional response to the conditions. The purpose of the mediating variables was to determine what emotions drive the respondent's reaction to the conditions.

Research Setting and Sample

Population. The target population for this study was aviation consumers in India and the United States. Specifically, the target population

was airline passengers. For the purposes of this study, the accessible population was people who have internet access and have an account for Amazon's ® Mechanical Turk ® (MTurk).

Sample. An a priori analysis using G*Power indicates that this study would require 128 total participants. To determine the required sample size, the following parameters were used, a medium effect size (0.25) with alpha of .05 and power of .80. Within the program, F test was selected for test family and for statistical test, "ANOVA: Fixed effects, special, main effects and interactions" was selected. The type of power analysis selected was "A priori: Compute required sample size – given α, power, and effect size". The Numerator df was entered as 1 and the number of groups was 8. These selections resulted in a minimum sample size of 128 participants and a critical F of 3.9201244. Mediation analyses require 100 participants per condition. This study will use 8 conditions, therefore the total sample size for this research project is a total of 800 participants, $N = 800$.

The sample of the population was recruited using Amazon's ® Mechanical Turk ® (MTurk). This system provides a nonprobability convenience sample. Nonprobability convenience sampling has the ability to provide a large number of participants. Research published by Buhrmester, Kwang, & Gosling (2011) and Germaine, Nakayama, Duchaine, Chabris, Chatterjee, & Wilmer (2012) show that MTurk data is as reliable as data

collected in a laboratory. The sample included participants from the United States and India. The participants were provided with the research instruments via the Fluid Survey online questionnaire system. Through the MTurk system, participants were compensated for their involvement.

Instrumentation

In order to collect the required primary data from the participants, survey instruments were used. According to Barnard (2000) and Klinek (2009) a survey instrument is a preferred method for data collection in social science research, and surveys are most commonly used to gather information and to test theories about human behavior (Groves et al., 2009). These surveys were administered using FluidSurveys online service through Amazon's ® Mechanical Turk ® (MTurk). Participants were those from India and the United States with an MTurk account and were compensated through MTurk.

Using the MTurk service, participants were asked demographic data including gender and country of origin. The participants were be provided brief descriptions of the two training methodologies (Appendix A) addressed in this study, traditional path and MPL. Participants were required to successfully complete a short quiz in order to confirm that they understood the differences between the two pilot training methodologies. The Willingness to Fly scale created by Rice et al. (2015) (Appendix C) was used to capture the respondent's

rating of their willingness to fly based on the two pilot training methodology scenarios. The scale consists of seven statements with which they rate their willingness to fly. The scale uses a Likert-type scale of strongly disagree (-2) to strongly agree (+2) with a choice of zero as neutral. Likert-type scales were appropriate in this study because they have been found to provide valid results in both parametric and non-parametric test. (Murray, 2013). Likert-type scales are easy for participants to use and they are reliable (Royeen, 1985). This scale has been shown to be valid and reliable in previous research. Examples of the statements on this scale include, "I would be comfortable flying on this flight", and "I have no fear flying on this flight".

Next, participants were provided the pilot training scenarios and asked to report their feelings towards the scenarios using Ekman and Friesen's (1971) universal emotions. In order to measure the respondent's emotional response to the scenarios, they were shown images of the six universal emotions (Figure B) in random order and asked "Based on the scenario above, how strongly do you feel like the image shown?" Participants manipulated a slider with their computer mouse. The slider scale had scale ends of "I do not feel this way at all" to "I extremely feel this way". The scores ranged from 0 to 100, though the participants were not aware of this score scale.

Validity

According to Cohen (2009), the question of validity refers to the ability of a researcher to gain inferences from data collected from a sample or population. Validity is examined from two perspectives, internal and external. Internal validity refers to the study's design and how well conclusions drawn in the study are warranted. Threats to internal validity must be addressed in order to insure that results gained from a research study are inferentially justified. Potential threats to internal validity include history, maturation, instrumentation, selection, and mortality. History refers to the impact external events may have on participant's responses to an instrument. In the case that an event related to pilot training methodology occurs during the course of this study, the event will be acknowledged and addressed as having a possible impact on the results of the study. Maturation has to do with changes in the participants during the course of the study. Instrumentation refers to changes made to the instrument during the course of a study. Mortality is a threat to internal validity in the event that participants drop out of the study. Because data will be gathered from the participants at one point in time, maturation, instrumentation, and mortality were not a concern. Selection refers to differences between groups that may interact with the dependent variable. MTurk uses a randomization function which limit the effects of selection.

External validity refers to the generalizability of the study; it is the extent to which conclusion made in a study can be applied to the larger population, or different situations. Because of the sampling strategy employed in this study, results may only be generalized to Indian and American consumers who have an Amazon MTurk account and were online at the time that the survey is available.

Reliability

Cohen (2009) defines reliability as the consistency of results that an instrument produces when the thing being measured does not change. Cronbach (1951) states that a reliability of 0.70 or higher is acceptable. Rice et al. (2015) report that the Willingness to Fly scale is both valid and reliable.

Data Collection and Management

Data for this study were collected via Amazon's MTurk service using Fluid Surveys. Upon approval of this proposal, the instrumentation was made available to the required participants by use of these online services. The instruments remained available to those with MTurk accounts until the required number of participants was reached, at which time the surveys were closed. The data was retrieved, and the file imported into SPSS. The data files were stored on an external hard drive which can be disconnected and stored in a locked file cabinet. No one other than the researcher has access to open the file cabinet. The data file will be retained for a period not to exceed three years and then the file will be erased. The participants

were Indian and American individuals who have MTurk accounts. By the nature of the MTurk service, the participants' identities remain anonymous; there is no way to link an individual respondent to any set of survey results.

Data Analysis Procedures

Once data collection was complete, a preliminary analysis was performed to insure that the data was complete and coded properly. Completeness means that the respondents answered all questions. A descriptive statistical analysis was run and the results saved. Next, the data were analyzed to determine if it satisfies the ANOVA assumptions. IBM SPSS 23 statistical analysis software was used in order to determine if the assumptions were satisfied. After inputting the data into SPSS, the residuals were examined. Because analysis of the assumptions focuses on the residuals, an examination of the distribution and variance of the residuals was required. The sum of the residuals was not considered because their sum would, theoretically, equal zero.

Because this study used three factors with two levels each, the factors were combined into one study. This was a more efficient way of examining the factors than doing separate experiments for each factor. In order to determine if any relationships exist between the factors, the three-way ANOVA was the appropriate statistical analysis to use. A three-way, or 2x2x2 ANOVA was performed to answer the first four research questions, followed by

bootstrapping mediation analyses in order to answer the last two research questions. Bootstrapping, as described by Preacher, Rucker, and Hayes (2007) was employed to determine which, if any, of the six universal emotions mediate the relationship between the independent and dependent variables.

Legal & Ethical Consideration

In conducting human subject research, it is imperative to protect the participants as well as the data collected. In order to insure that human subject safety concerns are protected, an application was completed and submitted to the Florida Institute of Technology Institutional Review Board (IRB) Office. Because the participants were all adults, an exempt IRB approval was eceived for this study. The data was anonymous when collected via the online services, MTurk and Fluid Surveys. All respondents were anonymous in any reporting of data and in no way were the participants linked to the research project. Risk to the participants was negligible, as their participation was no more than normal daily activity. Individuals must choose to open an MTurk account and they choose to spend their time completing surveys for compensation. There is no way that participants can be coerced to begin or complete a survey through MTurk. The data file was protected by it being stored on an external drive and that drive kept in a locked file cabinet. After three years of the completion of the study, the data file will be destroyed.

Limitations

Research studies are impacted by limitations. Limitations can come from multiple sources and while they cannot be eliminated they need to be acknowledged. Limitations are those things which are beyond the researcher's ability to control. Creswell (2005) stated that identifying limitations inherent in a study determines the parameters of that study. The first limitation with this study was a matter of generalizability. Because a convenience sample taken from Indian and American users of Amazon's MTurk was used, the results of this study can only be generalized to individuals from those countries who were online at the time the surveys were active. The sampling strategy employed in this study limits the generalizability to any larger population.

The second limitation associated with this study has to do with the aviation backgrounds of the participants. There is the possibility that some number of the participants were not aviation consumers. If this was the case, the scenarios were strictly theoretical for them; they would have no practical experience on an airline flight.

Delimitations

Delimitations represent choices made by the researcher which can have an impact on the results of the study. Delimitations are things the research did or did not do; these are within the control of the researcher. One delimitations in this

study was the problem itself. In this study, the effect of training methodology on an aviation consumer's willingness to fly was chosen. There are other areas associated with willingness to fly which could have been addressed. Pilot training methodology was chosen because of the lack of research in this area, particularly for MPL. Another delimitation was the sample. Only participants from India or the United States were recruited. These two countries were selected for their different cultures. The differences between an individualistic culture, like India, and a collectivistic culture, like the United States, may provide additional insight into the factors that affect an individual's willingness to fly. Another possible delimitation were the instruments being used in this study. The scenarios prepared for the study may have been either confusing to the participants, or they may have introduced some unintended bias. The willingness to fly scale, while shown to be valid and reliable may have contained some flaws that could have caused confusion for the respondents. Finally, the six universal emotions do not receive universal acceptance; there is some disagreement in the literature if these six emotions are truly universal. In the researcher's opinion, the research on the six universal emotions is compelling and demonstrate that Ekman and Friesen's (1971) work has captured a phenomena that is adequately universal.

Summary

This chapter provides the detail necessary to describe the study's methodology. The statement of the problem, research questions and hypotheses

were described. The chapter continued with an explanation of the research methodology and design as well as power analysis. The population and sample were described. An explanation of the instrumentation that will be used to collect data in this study was presented. Issues related to validity and reliability were discussed, followed by a description of the data collection and management procedures that will be followed. Finally, the data analysis method along with the attention to participant protection and limitations and delimitations were described. Chapter 4 of this study will present the results of the research and those results will be interpreted. Chapter 5 of this study will discuss the conclusions reached as a result of the data interpretation.

Chapter 4

Results

The purpose of this chapter is to provide the findings of the study. This study examined consumers' perceptions of flying as a passenger on a flight flown by a pilot trained under the traditional path versus a pilot trained under MPL. The purpose of this quantitative experimental study was to determine to what extent gender, country of origin and pilot training methodology effect an aviation consumer's willingness to fly. Additionally, this study attempted to determine what emotions mediated a consumer's decision. Participants from India and the United States were recruited through Amazon's ® Mechanical Turk ® (MTurk) and asked to complete the survey instruments via Fluid Surveys.

Research Tools

In order to collect the required primary data from the participants, survey instruments were used. These surveys were administered using FluidSurveys online service through Amazon's ® Mechanical Turk ® (MTurk). Participants were those from India and the United States with an MTurk account and were compensated through MTurk.

Using the MTurk service, participants were asked demographic data including gender and country of origin. The participants were then provided brief descriptions of the two training methodologies (Appendix A) addressed in

this study, traditional path and MPL. Next, the participants were required to complete a short quiz about the differences between the traditional path and MPL. The Willingness to Fly scale created by Rice et al. (2015) (Appendix C) was used to capture the respondent's rating of their willingness to fly based on the two pilot training methodology scenarios. The scale consists of seven statements with which they rate their willingness to fly. The scale uses a Likert-type scale of strongly disagree (-2) to strongly agree (+2) with a choice of zero as neutral. This scale has been shown to be valid and reliable in previous research. Examples of the statements on this scale include, *I would be comfortable flying with this airline*, and *I have no fear flying with this airline*.

Next, participants were provided the pilot training scenarios and asked to report their feelings towards the scenarios using Ekman and Friesen's (1971) universal emotions. In order to measure the respondent's emotional response to the scenarios, they were shown images of the six universal emotions (Figure B) in random order and asked "Based on the scenario above, how strongly do you feel like the image shown?" Participants manipulated a slider with their computer mouse. The slider scale had scale ends of "I do not feel this way at all" to "I extremely feel this way". The scores ranged from 0 to 100, though the participants were not aware of this score scale.

Descriptive Statistics

The sample size of the study was 980 participants. Of these, there were 350 females and 630 males. In terms of country of origin, 488 (49.5%) were Indian and 492 (50.5%) were American. The mean age of the female respondents was 34.71 (*SD* = 10.39) and of the males, 32.27 (*SD* = 8.95). The mean age of all respondents was 33.13 (*SD* = 9.58). Table 1 presents the demographics for all participants.

Table 1

Summary of Participants' Age and Country of Origin by Gender

				Country of Origin			
	Age			USA		India	
Group	*N*	*M*	*SD*	*N*	%	*N*	%
Female	350	34.71	10.39	195	20.0%	155	17.3%
Male	630	32.27	8.95	297	30.4%	333	32.3%
Overall	980	33.13	9.58	492	50.4%	488	49.6%

The participants were provided scenarios representing flying on a flight as a passenger flown by a pilot trained under the traditional pilot training path or under the MPL path. An examination of the number of participants in each condition and a description of their ages produces the following. The mean age of traditional path respondents was 33.01 (*N* = 483, *SD* = 9.33) and MPL respondents was 32.71 (*N* = 497, *SD* = 9.19). The mean age of Indian participants was 33.39 (*N* = 488, *SD* = 10.32) and American participants was 32.46 (*N* = 492, *SD* = 7.88). The mean age of female participants was 32.11 (*N* = 350, *SD* = 8.67) and male participants was

34.41 (N = 630, SD = 9.90). Table 2 indicates the number of participants in each condition and the descriptive statistics of age.

Traditional training path scenarios were provided to 240 American participants (144 Male and 96 Female) in order to measure the respondent's willingness to fly. The average age of the 144 male participants was 32.76 (SD = 9.40) and the average age of the 96 female participants was 35.07 (SD = 10.66). The same scenarios were provided to Indian participants (N = 243). Of these participants, 162 were male and 81 were female. The average age of the 162 male respondents was 32.08 (SD = 8.30) and the 81 female was 33.75 (SD = 8.41).

MPL training path scenarios were provided to 252 American participants (153 Male and 99 Female) to quantify their perception of willingness to fly. The average age of the 153 male participants was 31.31 (SD = 9.28) and average age of the 99 female participants was 35.86 (SD = 11.92). The same MPL training scenarios were provided to 245 Indian participants. Of these respondents, 171 were male and 74 were female. The average age of the male respondents was 32.29 *(SD* = 7.79) and the female was 32.30 (SD = 6.47).

Table 2

Means and Standard Deviations of Participants' Ages

Type of Training	Country of Origin	Gender	Mean (*M*)	Std. Deviation (*SD*)	*N*
Traditional	USA	Male	32.76	9.40	144
		Female	35.07	10.66	96
	India	Male	32.08	8.30	162
		Female	33.75	8.41	81
MPL	USA	Male	31.31	9.28	153
		Female	35.86	11.92	99
	India	Male	32.29	7.79	171
		Female	32.30	6.47	74
Type of Training		Traditional	33.01	9.33	483
		MPL	32.71	9.19	497
Country of Origin		India	33.39	10.31	492
		USA	32.46	7.88	488
Gender		Female	32.11	8.67	350
		Male	34.41	9.90	630

Note: The summary of descriptive statistics such as mean (M), standard deviation (SD), and sample size (N) of each independent variable (Type of Training, Gender, and Country of Origin) and overall participants.

After having information about traditional training path and MPL training path presented to them, participants were asked to rate their emotions based on Ekman and Friesen's (1971) six universal emotions. All the participants rated their feeling of anger, disgust, fear, happiness, sadness, and surprise on a scale that ranges from 0 to 100 (see Appendix B for the emotions). Table 3 gives the averages of the emotion scales by condition.

The average anger rating of male participants was 24.53 (*SD* = 27.18, *N* = 630) and the average anger rating of female participants was 25.16 (*SD* = 28.82 *N* = 350). The average anger rating of American participants was 21.05 (*SD* = 26.83, *N* = 492) and the average anger rating of Indian participants was 28.51 (*SD* = 28.21, *N* = 488). The average anger rating of participants who were presented tradition pilot training path information was 16.82 (*SD* = 23.36, *N* = 483). The average anger rating of participants who were presented MPL pilot training path information was 32.51 (*SD* = 29.39, *N* = 497).

Traditional pilot training path information was presented to participants to rate their anger. American male participants' average anger rating was 10.65 (*SD* = 18.95, *N* = 144). American female participants' average anger rating was 8.18 (*SD* = 15.52, *N* = 96). The average anger rating of Indian male participants was 25.02 (*SD* = 26.81, *N* = 162) and the average anger rating of Indian female participants was 21.60 (*SD* = 25.18, *N* = 81).

MPL pilot training information was presented to participants to rate their anger. American male participants' average anger rating was 27.94 (*SD* = 26.74 *N* = 153). American female participants' average anger rating was 38.01 (*SD* = 32.43, *N* = 99). The average anger rating of Indian male participants was 32.84 (*SD* = 29.48, *N* = 171), while the average anger rating of Indian female participants was 33.74 (*SD* = 29.21 *N* = 74).

The average disgust rating of male participants was 21.71 (*SD* = 25.03, *N* = 630) and the average disgust rating of female participants was 20.97 (*SD* = 25.80, *N* = 350). The average disgust rating of American participants was 16.67 (*SD* = 23.22, *N* = 492) and the average disgust rating of Indian participants was 26.28 (*SD* = 26.40, *N* = 488). The average disgust rating of participants who were presented with traditional pilot path training information was 15.23 (*SD* = 21.24, *N* = 483). The average disgust rating of participants who were presented MPL pilot training information was 27.52 (*SD* = 27.31, *N* = 497).

Traditional pilot training path information was presented to participants to rate their disgust. American male participants' average disgust rating was 9.85 (*SD* = 17.78, *N* = 144). American female participants' average disgust rating was 7.16 (*SD* = 12.91, *N* = 96). The average disgust rating of Indian male participants was 23.20 (*SD* = 23.95, *N* = 162); the average disgust rating of Indian female participants was 18.41 (*SD* = 23.71, *N* = 81).

MPL pilot training information was presented to participants to rate their disgust. American male participants' average disgust rating was 21.89 (*SD* = 24.27 *N* = 153). American female participants' average disgust rating was 27.75 (*SD* = 28.98, *N* = 99). The average disgust rating of Indian male participants was 30.22 (*SD* = 28.12, *N* = 171), while the average disgust rating of Indian female participants was 32.58 (*SD* = 27.62, *N* = 74).

The average fear rating of male participants was 28.17 (*SD* = 30.10, *N* = 630) and the average fear rating of female participants was 29.31 (*SD* = 31.57, *N* = 350). The average fear rating of American participants was 28.22 (*SD* = 32.55, *N* = 492) and the average fear rating of Indian participants was 28.94 (*SD* = 28.57, *N* = 488). The average fear rating of participants who were presented traditional pilot training path information was 17.55 (*SD* = 23.41, *N* = 483). The average fear rating of participants who were presented MPL pilot training information was 39.35 (*SD* = 32.83, *N* = 497).

Traditional pilot training path information was presented to participants to rate their fear. American male participants' average fear rating was 12.49 (*SD* = 20.71, *N* = 144). American female participants' average fear rating was 11.02 (*SD* = 20.31, *N* = 96). The average fear rating of Indian male participants was 23.34 (*SD* = 25.41, *N* = 162), while the average fear rating of Indian female participants was 22.65 (*SD* = 24.38, *N* = 81).

MPL pilot training information was presented to participants to rate their fear. American male participants' average fear rating was 40.11 (*SD* = 33.40 *N* = 153). In contrast, American female participants' average fear rating was 49.47 (*SD* = 34.97, *N* = 99). The average fear rating of Indian male participants was 35.46 (*SD* = 31.23, *N* = 171) and the average fear rating of Indian female participants was 33.07 (*SD* = 29.50, *N* = 74).

The average happiness rating of male participants was 58.62 (*SD* = 32.50, *N* = 630) and the average happiness rating of female participants was 59.58 (*SD* = 32.36, *N* = 350). The average happiness rating of American participants was 52.06 (*SD* = 33.59, *N* = 492) and the average happiness rating of Indian participants was 65.95 (*SD* = 29.66, *N* = 488). The average happiness rating of participants who were presented traditional pilot training path information was 69.59 (*SD* = 27.59, *N* = 483). The average happiness rating of participants who were presented MPL pilot training information was 48.34 (*SD* = 32.98, *N* = 497).

Traditional pilot training path information was presented to participants to rate their happiness. American male participants' average happiness rating was 67.31 (*SD* = 30.06, *N* = 144). American female participants' average happiness rating was 69.16 (*SD* = 28.02, *N* = 96). The average happiness rating of Indian male participants was 69.33 (*SD* = 28.13, *N* = 162); in contrast, the average happiness rating of Indian female participants was 76.30 (*SD* = 22.76, *N* = 81).

MPL pilot training information was presented to participants to rate their happiness. American male participants' average happiness rating was 38.42 (*SD* = 29.83 *N* = 153). American female participants' average happiness rating was 34.28 (*SD* = 30.92, *N* = 99). The average happiness rating of Indian male participants was 59.05 (*SD* = 32.62, *N* = 171), while the average happiness rating of Indian female participants was 63.11 (*SD* = 28.53, *N* = 74).

The average sadness rating of male participants was 22.85 (*SD* = 26.78, *N* = 630) and the average sadness rating of female participants was 24.48 (*SD* = 27.67, *N* = 350). The average sadness rating of the American participants was 19.74 (*SD* = 25.89, *N* = 492) and the average sadness rating of the Indian participants was 27.17 (*SD* = 27.79, *N* = 488). The average sadness rating of participants that were presented traditional pilot training path information was 15.45 (*SD* = 21.71, *N* = 483). The average sadness rating of participants that were presented MPL pilot training information was 31.23 (*SD* = 29.38, *N* = 497).

Traditional pilot training path information was presented to participants to rate their sadness. American male participants' average sadness rating was 10.40 (*SD* = 18.54, *N* = 144). American female participants' average sadness rating was 8.22 (*SD* = 15.27, *N* = 96). The average sadness rating of Indian male participants was 21.75 (*SD* = 24.48, *N* = 162), while the average sadness rating of Indian female participants was 20.40 (*SD* = 23.75, *N* = 81).

MPL pilot training information was presented to rate their sadness. American male participants' average sadness rating was 25.54 (*SD* = 27.33, *N* = 153). American female participants' average sadness rating was 35.54 (*SD* = 30.16, *N* = 99). The average sadness rating of Indian male participants was 32.11 (*SD* = 30.11, *N* = 171), while the average sadness rating of Indian female participants was 35.14 (*SD* = 29.44, *N* = 74).

The average surprise rating of male participants was 35.88 (*SD* = 29.72, *N* = 630) and the average surprise rating of female participants was 34.90 (*SD* = 30.66, *N* = 350). The average surprise rating of American participants was 32.24 (*SD* = 30.24, *N* = 492) and the average surprise rating of Indian participants was 38.86 (*SD* = 29.52, *N* = 488). The average surprise rating of participants who were presented traditional pilot training path information was 27.47 (*SD* = 28.29, *N* = 483). The average surprise rating of participants who were presented MPL pilot training information was 43.36 (*SD* = 29.51, *N* = 497).

Traditional pilot training path information was presented to participants to rate their surprise. American male participants' average surprise rating was 21.65 (*SD* = 26.67, *N* = 144). American female participants' average surprise rating was 16.37 (*SD* = 22.18, *N* = 96). The average surprise rating of Indian male participants was 36.01 (*SD* = 29.54, *N* = 162) and the average surprise rating of Indian female participants was 34.14 (*SD* = 29.43, *N* = 81).

MPL pilot training information was presented to participants to rate their surprise. American male participants' average surprise rating was 41.07 (*SD* = 28.27 *N* = 153). American female participants' average surprise rating was 49.43 (*SD* = 31.48, *N* = 99). The average surprise rating of Indian male participants was 43.25 (*SD* = 29.63, *N* = 171); the average surprise rating of Indian female participants was 40.14 (*SD* = 28.36 *N* = 74).

Table 3

Means and Standard Deviations on the Measure of Each Emotion as a Function of Training Methodology, Country, and Gender

			Anger		Disgust		Fear		Happiness		Sadness		Surprise		
			M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*N*
Traditional	USA	Male	10.65	18.95	9.85	17.78	12.49	20.71	67.31	30.06	10.40	18.54	21.65	26.67	144
		Female	8.18	15.52	7.16	12.91	11.02	20.31	69.16	28.02	8.22	15.27	16.37	22.18	96
	India	Male	25.02	26.81	23.20	23.95	23.34	25.41	69.33	28.13	21.75	24.48	36.01	29.54	162
		Female	21.60	25.18	18.41	23.71	22.65	24.38	76.30	22.76	20.40	23.75	34.14	29.43	81
MPL	USA	Male	27.94	26.74	21.89	24.27	40.11	33.40	38.42	29.83	25.54	27.33	41.07	28.27	153
		Female	38.01	32.43	27.75	28.98	49.47	34.97	34.28	30.92	35.54	30.16	49.43	31.48	99
	India	Male	32.84	29.48	30.22	28.12	35.46	31.23	59.05	32.62	32.11	30.11	43.25	29.63	171
		Female	33.74	29.21	32.58	27.62	33.07	29.50	63.11	28.53	35.14	29.44	40.14	28.36	74
Training		Traditional	16.82	23.36	15.23	21.24	17.55	23.41	69.59	27.99	15.45	21.71	27.47	28.29	483
		MPL	32.51	29.39	27.52	27.31	39.35	32.83	48.34	32.98	31.23	29.38	43.36	29.51	497
COO		USA	21.05	26.83	16.67	23.22	28.22	32.55	52.06	33.59	19.74	25.89	32.24	30.24	492
		India	28.51	28.21	26.28	26.40	28.94	28.57	65.95	29.66	27.17	27.79	38.86	29.52	488
Gender		Male	24.53	27.18	21.71	25.03	28.17	30.10	58.62	32.50	22.85	26.78	35.88	29.72	630
		Female	25.16	28.82	20.97	25.80	29.31	31.57	59.58	32.36	24.48	27.67	34.90	30.66	350

Participants were presented information about traditional pilot training path and MPL pilot training. They were asked to rate their willingness to fly with the airlines on five-point Likert scale between -2 and +2. The average willingness to fly rating of traditional pilot training respondents was 1.15 (SD = 0.67, N = 483) and MPL pilot training respondents was 0.27 (SD = 1.07, N = 497). The average willingness to fly rating of American participants was 0.55 (SD = 1.10, N = 492), and Indian participants was 0.86 (SD = 0.86, N = 488). The average willingness to fly rating of male participants was 0.73 (SD = 0.98, N = 630) and female participants was 0.65 (SD = 1.04, N = 350).

The average traditional pilot training path willingness to fly rating of American male participants was 1.19 (SD = 0.69, N = 144) and American female participants was 1.16 (SD = 0.70, N = 96). Indian male participants' average traditional pilot training willingness to fly rating was 1.13 (SD = 0.64, N = 162) and Indian female participants' was 1.10 (SD = 0.69, N = 81).

The average MPL pilot training willingness to fly rating of American male participants was 0.06 (SD = 1.03, N = 153) and American female participants was -0.23 (SD = 1.14, N = 99). Indian male participants' average MPL pilot training willingness to fly rating was 0.56 (SD = 1.02, N = 171) and Indian female participants' was 0.68 (SD = 0.78, N = 74).

Table 4 indicates averages of willingness to fly ratings by conditions.

Table 4

Means and Standard Deviations on the Measure of Willingness to Fly as a Function of Training Methodology, Country of Origin, and Gender

Training Methodology	Country of Origin	Gender	Mean (*M*)	Std. Deviation (*SD*)	*N*
Traditional	USA	Male	1.19	0.69	144
		Female	1.16	0.70	96
	Indian	Male	1.13	0.64	162
		Female	1.10	0.69	81
MPL	USA	Male	0.06	1.03	153
		Female	-0.23	1.14	99
	Indian	Male	0.56	1.02	171
		Female	0.68	0.78	74
Training		Traditional	1.15	0.67	483
		MPL	0.27	1.07	497
Country of Origin		USA	0.55	1.10	492
		Indian	0.86	0.86	488
Gender		Male	0.73	0.98	630
		Female	0.65	1.04	350

Note: The summary of descriptive statistics such as mean (M), standard deviation (SD), and sample size (N) of various groups looked at willingness to fly based on country of origin, gender, and pilot training methodology. This also includes M, SD, and N of each independent variable (Training Methodology, Gender, and Country of Origin).

Outlier Analysis

An outlier analysis was performed which produced boxplots in SPSS. Outliers were found in several groups. There were three outliers in the traditional training, American, male group. Two of the three outliers were identified as greater than 1.5, but less than 3 box-lengths from the edge of the box, one was greater than

3 box-lengths from the edge of the box. One outlier was identified in the traditional training, American, female group. This outlier was greater than 1.5, but less than 3 box-lengths from the edge of the box. Five outliers were found in the traditional training, Indian, male group. Four of the five outliers were identified as greater than 1.5, but less than 3 box-lengths from the edge of the box, one was greater than 3 box-lengths from the edge of the box. Three outliers were identified in the traditional training, Indian, female group. Two of the three outliers were identified as greater than 1.5, but less than 3 box-lengths from the edge of the box, one was greater than 3 box-lengths from the edge of the box. Four outliers were found in the MPL, Indian, male group. These outliers were all greater than 1.5, but less than 3 box-lengths from the edge of the box. There were six outliers identified in the MPL, India, and female group. Of these outliers, five were greater than 1.5, but less than 3 box-lengths from the edge of the box, one was greater than 3 box-lengths from the edge of the box.

Possible sources of outliers include data entry errors, measurement error and/or genuinely unusual values. The outliers could not be a result of data entry error because the data was compiled by FluidSurveys and the file produced was simply downloaded for analysis; there was no data entry conducted. The outliers were reviewed in the dataset. The values for willingness to fly were within the possible range of responses for these respondents, therefore it is unlikely that these represent measurement errors. It appears that these outliers are genuinely unusual

values. Because the identified outliers were assumed to be genuinely unusual values, meaning that these were actual responses made by participants, the decision was made to include these values in the analysis of the data as they represent the respondent's true views.

Assumption Testing

There are six assumptions which must be considered in a three-way ANOVA. First there must be one dependent variable that is measured as continuous. The DV in this study is willingness to fly which is a measurement of a respondent's reported willingness to fly on a flight as a passenger in a given scenario. Responses are Likert, i.e. continuous. The second assumption is that there are three independent variables where each variable consists of two or more categorical, independent groups. The IV's in this study are gender, country of origin, and training methodology. Each of these IV's are dichotomous variables as there can only be male or female for gender, American or Indian for country of origin, and traditional path or MPL for training methodology. While society today recognizes multiple definitions for gender, in this study each of the three IV's are considered to be fixed factors as defined above. The third assumption of a three-way ANOVA is that there are independence of observations, meaning that there is no relationship between the observations within each group of IV's or between the groups themselves. Due to the nature of Amazon's ® Mechanical Turk ® (MTurk), the only ways this assumption could have been violated is if an individual had

multiple MTurk accounts, or if multiple respondents were co-located and responded to the survey instruments together. For the purposes of this study, these occurrences would be considered extremely unlikely. Given the number of respondents ($N = 980$), the effect of even a few instances of the violation described above would be negligible.

Assumption 4 of a three-way ANOVA is that there are no significant outliers in the data. The fifth assumption is that the dependent variable should be approximately normally distributed and the sixth assumption is that there is homogeneity of variances. This means that the variance of the DV should be approximately equal. The satisfaction of these three assumptions is discussed in the Assumption Testing section below.

In this study, normal distribution of the dependent variable, the fifth assumption of a three-way ANOVA was determined to be violated. The Shapiro-Wilk test of normality was conducted in SPSS. In order for there to be normal distribution, the result of the Shapiro-Wilk test must show a significance greater than .05 ($p > .05$). The level of significance for all cells was less than p = .05. ANOVA is considered to be a fairly robust to deviations of normality. This is particularly true when sample sizes are not too small. With an overall N of 980, the sample size should be adequate to handle the violation of this assumption.

The sixth assumption in a three-way ANOVA is the assumption of homogeneity of variances. For this assumption, the Levene's Test of Equality of

Error Variances is consulted. The results of the Levene's test indicated a lack of homogeneity of variances ($p < .001$). Assumption six was violated. While the assumption of homogeneity of variance was violated based on the Levene's test, ANOVA is robust to this violation as long as the Ns of the groups are fairly equivalent. In this case, the group Ns are almost identical for Country and Training Type. While they are different for Gender, the difference should not negatively affect the ability to conduct the hypothesis testing procedure using parametric tests. Even if it does negatively affect the criterion by inflating the odds of a Type 1 error, the p-value that I care about is so low ($p < .001$) that it is unlikely to have an effect that would cause an incorrectly rejection of the null in this case, particularly since I am not making the case that Gender is significant (it was not found to be significant in any of the main effects or interactions).

Inferential Statistics

ANOVA Analysis. A three-way ANOVA was conducted using SPSS. For the analysis, training type, country of origin, and gender were the independent variables and Willingness To Fly was the dependent variable. Each of the three independent variables had two levels, making this a 2 x 2 x 2 factorial ANOVA design. In order to demonstrate statistical significance, p-values needed to be lower than .05.

ANOVA Analysis for Willingness to Fly. The purpose of the ANOVA was to determine if any main effects or interaction existed for Willingness to Fly. Possible outcomes from the analysis included main effects, two-way interactions and a three-way interaction (see table for results of F-tests). Results of the ANOVA analysis indicated that a three-way interaction did not exist, however there were two significant main effects for training and for country, and a significant two-way interaction effect between training and country. In other words, the effect of training methodology on Willingness to Fly depends on the country of origin and vice-versa. The model was statistically significant $F(7, 972) = 46.71$, $p < .001$, $\eta_p^2 = 0.252$ and accounted for 25% of the variability of the data around its mean. The data from the ANOVA output is presented in Table 5.

Analysis indicated that a statistically significant main effect for training existed $F(1, 972) = 227.76$, $p < .001$, $\eta_p^2 = 0.190$. Results indicate that participants demonstrate a higher willingness to fly with a pilot trained in the traditional path ($M = 1.15$, $SD = 0.67$) as opposed to a pilot trained under MPL ($M = 0.27$, $SD = 1.07$). A significant main effect also existed for country of origin $F(1, 972) = 28.86$, $p < .001$, $\eta_p^2 = 0.029$. Respondents from India demonstrated a higher willingness to fly ($M = 0.86$, $SD = 0.86$) than Americans ($M = 0.55$, $SD = 1.10$). Results also indicated a significant interaction between training and country, $F(1, 972) = 30.37$, $p < .001$, $\eta_p^2 = 0.040$, indicating that the respondent's country of origin has an effect on their preference for a particular methodology of pilot training.

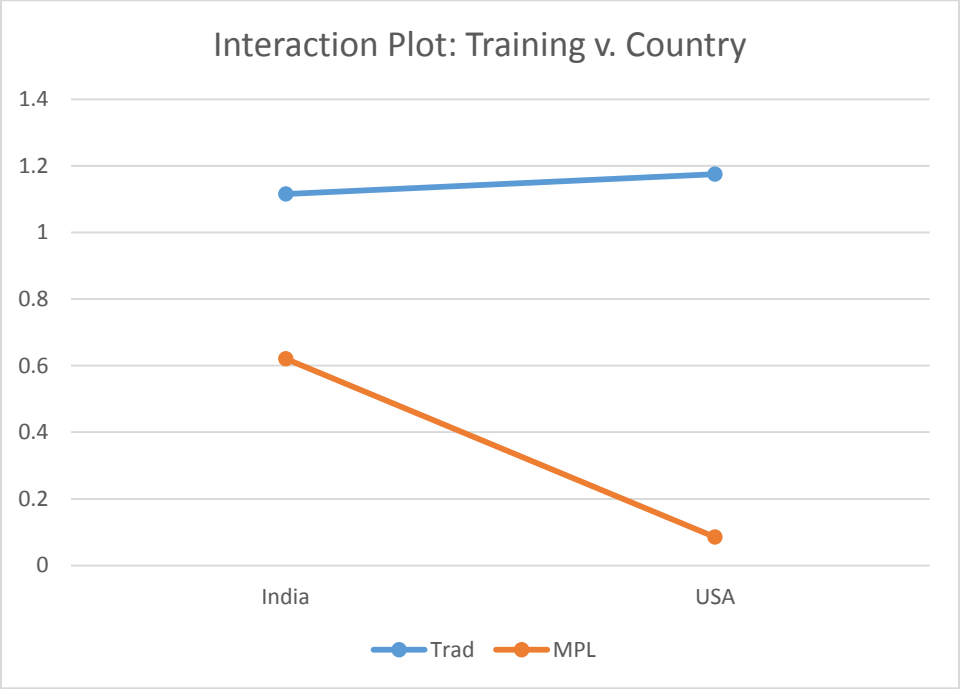

Figure 1. Interaction plot of two-way interaction between training type and country of origin

Table 5

Three-Way Analysis of Variance Output of Willingness to Fly

Source	df	Sum of Squares	F Ratio	Prob >F	Partial Eta Squared
Model	7	245.17	46.71	.000	.252
Training	1	170.79	227.79	.000	.190
Country of Origin	1	21.64	28.86	.000	.029
Gender	1	.570	.760	.384	.001
Training*COO	1	30.369	40.50	.000	.040
Training*Gender	1	.138	.174	.668	.000
Airline Type *Gender*COO	1	2.640	3.52	.061	.004
Error	972	728.80			
C. Total	979	973.96			

Mediation Analysis

Mediation analysis using Preacher and Hayes' (2008) bootstrapping method of multiple mediation analysis was used to determine if emotion had a mediating effect on the dependent variable. A pictorial presentation of the multiple mediating

variables and their possible effects is provided in figure 2. In the figure, *X* represents the independent variable, *M* are the mediating variables, and *Y* represents the dependent variable. In order to determine if an effect is present, the 95% confidence intervals (CI) are examined. If the 95% CI range does not include zero, a significant indirect mediating effect is indicated.

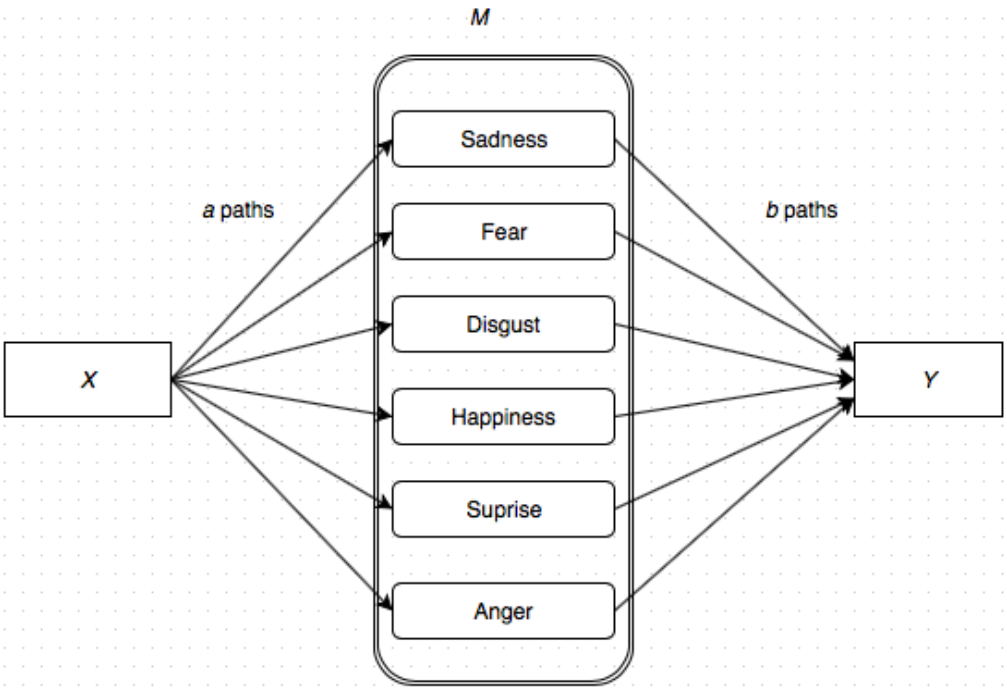

Figure 2. A pictorial presentation of multiple mediating effects

Mediation analyses were conducted on the two statistically significant main effects, training and country. Table 6 displays the results of the significant analyses. Results of the analysis for training indicate that the emotions fear, happiness, and surprise are significant. The 95% CI for fear is -.2960 to -.1100. The 95% CI for happiness is -.3603 to -.2200 and the 95% CI for surprise is .0010 to .0698. As the

value 0 does not fall within these CI ranges, these emotions are considered significant mediators for training. Results of the mediation analysis for country indicate that the emotion happy is significant. The 95% CI for happy is .1276 to .2558. Again, 0 does not fall within this range, happiness is a significant mediator for country.

Table 6

Mediation Analysis Confidence Intervals Results for the Six Universal Emotions

IV	DV	Sadness	Fear	Disgust	Happiness	Surprise	Anger
Training	Willingness to Fly	[(-.065) – (.008)]	[(.129) – (.297)]	[(-.067) – (-.003)]	[(.182) – (.315)]	[(-.036) – (.014)]	[(-.021) – (.072)]
COO	Willingness to Fly	[(-.037) – (-.007)]	[(-.103) – (-.013)]	[(-.019) – (.068)]	[(.153) – (.282)]	[(-.024) – (.021)]	[(-.075) – (-.001)]

Decisions on Hypotheses

Six research questions, and their associated null and alternate hypotheses, guided this study, the purpose of which was to determine if pilot training methodology, country of origin and gender have an effect on a passenger's willingness to fly. The first null hypotheses was that type of training does not have an effect on willingness to fly. For RQ1, reject the null hypothesis. There is a statistically significant result showing that type of pilot training methodology does effect a passenger's willingness to fly $F(1, 972) = 227.76$, $p < .001$, $\eta_p^2 = 0.190$. Results indicate that participants demonstrate a higher willingness to fly with a pilot trained in the traditional path ($M = 1.15$, $SD = 0.67$) as opposed to a pilot trained under MPL ($M = .27$, $SD = 1.07$).

The second null hypothesis was that gender of the participant does not have an effect on willingness to fly. Results indicated a non-significant outcome, $F(1, 972) = 0.76$, $p = 0.384$, $\eta_p^2 = 0.001$. Because there is a non-significant outcome for this hypothesis, the decision is to fail to reject the null.

The third null hypothesis of this study was that country of origin does not have an effect on willingness to fly. Results indicate a significant main effect existed for country of origin $F(1, 972) = 28.86$, $p < .001$, $\eta_p^2 = 0.029$. Respondents from India demonstrated a higher willingness to fly ($M = 0.86$, $SD = 0.86$) than Americans ($M = 0.55$, $SD = 1.10$). For this hypothesis, reject the null.

The fourth null hypothesis was that there would be no interactions present in the independent variables. Results indicated that a significant interaction existed between, training and country of origin, $F(1, 972) = 30.37$, $p < .001$, $\eta_p^2 = 0.040$. For this hypothesis, reject the null.

The fifth null hypothesis of this study was that affect does not mediate the relationship between the IV's and willingness to fly. The mediation analysis indicated that significant results were found for at least one emotion in each significant main effect. The emotions of fear, happiness and surprise were significant in training and the emotion of happiness was significant for the main effect, country. For this null hypothesis, reject the null.

The last null hypothesis was that there would be no specific emotions that mediate the relationship between the IVs and willingness to fly. Results of the mediation analysis for training indicate that the emotions fear, happiness, and surprise are significant. The 95% CI for fear is -.2960 to -.1100. The 95% CI for happy is -.3603 to -.2200, and the 95% CI for surprise is .0010 to .0698. As the value 0 does not fall within these CI ranges, these emotions are considered significant mediators for training. Results of the mediation analysis for country indicate that the emotion happy is significant. The 95% CI for happy is .1276 to .2558. Again, 0 does not fall within this range, happiness is a significant mediator for country. Given these results, reject the null hypothesis.

Summary

The purpose of this study was to determine if pilot training methodology, gender, and country of origin of the participants effected the participants' willingness to fly and which, if any emotions have a mediating effect of their willingness to fly. As a result of the ANOVA and mediation analyses, significant results were found. Of the six research questions and their associated hypotheses, all but one null hypotheses were rejected. There was a statistically significant result showing that type of pilot training methodology does effect a passenger's willingness to fly. Results indicate a significant main effect existed for country of origin and that a significant interaction existed between, training and country of origin. The mediation analysis indicated that significant results were found for at least one emotion in each significant main effect. Results of the mediation analysis for training indicated that the emotions fear, happiness, and surprise were significant and mediation analysis for country indicate that the emotion happiness was significant. These results may provide insight into how pilot training methodologies are communicated to the travelling public.

Chapter 5

Conclusions

The purpose of this study was to examine if pilot training methodology, country of origin, and gender have an effect of a passenger's willingness to fly, and which emotions mediate the relationship between these variables. In this study there were three independent variables, which included type of pilot training methodology, country of origin, and gender. Each of the independent variables consisted of two levels. For type of pilot training methodology, the levels were traditional path or MPL. For country of origin, American or Indian and for gender, male or female. In this study the dependent variable was willingness to fly.

The study also examined the effect a mediating variable, affect, and its possible implications in the respondents' reporting of their willingness to fly. The mediating variable was presented as the six universal emotions identified by Ekman and Friesen (1971). This study surveyed a total of 980 respondents (350 females) from the United States and India and presented to them information regarding two pilot training methodologies, traditional path and MPL. Each respondent was asked to rate their willingness to fly using the scale created and validated by Rice et al. (2015). Once data were collected, an ANOVA was conducted on that data. Results of the ANOVA indicated that two mediation analyses were required and they were conducted. The purpose and design of the study led to six research questions which

guided the study. These research questions and their associated null and alternate hypotheses are:

RQ1: What effect does type of training have on willingness to fly?

H_o: $X = 0$ Type of training does not have an effect on willingness to fly.

H_1: $X \neq 0$ Type of training does have an effect on willingness to fly.

RQ2: What effect does gender of the participant have on willingness to fly?

H_o: $X = 0$ Gender of the participant does not have an effect on willingness to fly.

H_2: $X \neq 0$ Gender of the participant does have an effect on willingness to fly.

RQ3: What effect does country of origin of the participant have on willingness to fly?

H_o: $X = 0$ Country of origin does not have an effect on willingness to fly.

H_3: $X \neq 0$ Country of origin does have an effect on willingness to fly.

RQ4: What interactions are present in the IVs?

H_o: $X = 0$ There are no interactions present in the IV's.

H_4: $X \neq 0$ There are interactions present in the IV's.

RQ5: Does affect mediate the relationship between the IVs and willingness to fly?

H_o: $X = 0$ Affect does not mediate the relationship between the IV's and willingness to fly.

H_5: $X \neq 0$ Affect does mediate the relationship between the IV's and willingness to fly.

RQ6: Which specific emotions mediate the relationship between the IVs and willingness to fly?

H_o: $X = 0$ There will be no specific emotions that mediate the relationship between the IVs and willingness to fly.

H_6: $X \neq 0$ There will be at least one specific emotion that mediates the relationship between the IVs and willingness to fly.

Summary of Findings

ANOVA Analysis. An ANOVA for willingness to fly was conducted to determine if there were significant main effects, two-way, or three-way interactions among the variables. The ANOVA analysis for willingness to fly indicated that two significant main effects and a significant two-way interaction existed. The main effects were for training and for country. Results indicated that respondents expressed a higher willingness to fly on a flight flown by a pilot trained under the

traditional path methodology and Indian respondents indicated a higher willingness to fly than Americans. The interaction existed between training and country. This result indicates that the effect of training methodology on Willingness to Fly depends on the country of origin and vice-versa.

Mediation Analysis. Because country of origin and training were significant main effects in the ANOVA analysis, mediation analyses were conducted on these two variables. The first mediation analysis conducted on training showed that the emotions fear, happiness and surprise were significant mediators between training methodology and willingness to fly. The second mediation analysis conducted on country of origin indicated that happiness was a mediator between country of origin and willingness to fly.

Discussion

The first research question which guided this study was, "what effect does type of training have on willingness to fly?". The null hypothesis associated with this research question was that type of training does not have an effect on willingness to fly. The alternate hypothesis associated with this research question was that type of training does not have an effect on willingness to fly.

Results of the ANOVA indicated a main effect for training. Respondents in this study demonstrated a higher willingness to fly rating for the

traditional path of pilot training as opposed to the MPL training path. The average willingness to fly rating of traditional pilot training respondents was significantly higher than those of the MPL pilot training respondents. This suggests that consumers who will be flying on airlines with pilots trained under the MPL path, would prefer, or be more willing to fly on a flight flown by a pilot trained under the traditional path.

A distinguishing characteristic of MPL training is its foundation in Competency Based Training (CBT) (Cushing, 2013). CBT has remained a tool used primarily in vocational training (Todd & Thomas, 2013). In 1999, the Australian Civil Aviation Safety Authority mandated the inclusion of competency based training methods for private and commercial pilot training. The inclusion of pilot training followed the Australian government's call for CBT in vocational and workplace training in the 1980's (Franks, Hay, & Mavin, 2014).

Competency Based Training has its roots in behaviorism. Morke et al., (2013) grounds the development of CBT in behaviorism. "The theoretical orientation of early CBT was towards behaviourism as represented in the works of experimental psychologists like Watson, Pavlov, Thorndike, and Skinner, whose legacy was a focus on observable behaviours" (Morke et al., 2013, p. 852). The author states that there is a clear lineage from the behaviorist psychology of the 1940's to contemporary CBT.

The fundamental tenets of CBT include the development of defined, measurable learning outcomes, assessment, working on clear component parts of a task or skill instead of a whole or larger ability, and advancement at the learners own pace (Franks, Hay, & Mavin, 2014, Todd & Thomas, 2013, Hodge, 2007, Morcke et al., 2013, Delamare Le Deist & Winterton, 2005). The literature provides significant support for this method of education or training (Franks, Hay, & Mavin, 2014, Todd & Thomas, 2013, Hodge, 2007, Morcke et al., 2013, Delamare Le Deist & Winterton, 2005). In spite of this support, the results of this study suggest that consumers do not recognize the value of CPT and therefore MPL, but prefer the traditional pilot training path.

In terms of consumer acceptance of and their willingness to fly on any given airline, airline marketers must be cognizant of these preferences and shape their marketing efforts accordingly in order to assuage any concerns that the traveling public may have about flying on a flight flown by a pilot trained under MPL. Additionally, countries using MPL may consider modifying the training footprint to require additional flight time before a pilot begins flying revenue flights. Also, the specificity and focus of MPL training should be communicated to the travelling public in an attempt to increase the acceptance and willingness to fly with these pilots.

The second research question which drove this study was, “what effect does gender of the participant have on willingness to fly?”. The hypotheses

associated with this research question included the null, gender of the participant does not have an effect on willingness to fly, and the alternate, gender of the participant does have an effect on willingness to fly.

After conducting the ANOVA, a main effect for gender did not exist. Results indicated a non-significant outcome. This result suggests that a respondent's gender did not affect their willingness to fly; males and females maintained a statistically insignificant difference in willingness to fly.

Much research exists that describe the differences between the genders. Gender differences, sometimes referred to as the gender gap, have been studied in different contexts and settings. Gender differences are apparent in a wide range of phenomena, from competitiveness, to emotional response, to decision making, to pay scales.

Feingold (1994) noted that temperamental gender difference studies showed that men are more assertive, aggressive and are less anxious than women. Rhodes and Pivik (2010) performed a study to measure differences in gender and age in risky driving situations. Male drivers reported more positive affect than female drivers and less perceived risk for the risky driving behaviors assessed. The researcher determined that the risky behaviors were attributable to risk perception and positive affect. Feingold (1994) performed a Meta-Analysis to examine gender differences in personality. The researcher examined 68 studies which provided findings from 105 independent samples (N =

17,729). Females scored higher than males for anxiety, yet showed that males scored higher for assertiveness than females.

The source of these differences has been discussed. Nolen-Hoeksman (1978) posited that gender differences may be artificially produced, be determined by biology or genetics, psychoanalytically caused, the product of sex-roles, or a result of learned helplessness. Feingold (1994) described three models that address the cause of gender differences. These models are: biological, sociocultural, and biosocial. The biological model suggests that differences in personality reflect temperamental differences between genders. The sociocultural model as described by Feingold (1994) posits that "social and cultural factors directly produce gender differences in personality traits" (p. 430). In this model, gender roles dictate sex differences in social behavior. This model also holds that social and cultural norms can lead to stereotypes which lead to sex differences in personality. In the biosocial model, it is believed that "biological and sociocultural factors are both proximal causes of gender differences" (Feingold, 1994, p. 431).

Important differences also exist in reported affect between males and females. LaFrance, Hecht, & Paluck (2003) reported that there are differences between the genders in how men and women express their emotions. Women tend to experience emotions more intensely and more frequently than men (Fujita, & Sandvik, 1991) and are more likely to report emotions connected

with a sense of loss of power (Fischer, Mosquera, Vianen, & Manstead, 2004). Conversely, according to Tiedens (2001), men are more likely to report emotions associated with power.

According to Lynch and Atkins (1988), the time and cost of travel are important to females and fear and intimidation are considered to be more important by female travelers than by males. Casinowsky (2013) reported that travel may be more stressful for female travelers than males. Fear associated with flying differs between the genders and changes with age for females (Frederickson, Annas, Fischer, & Wik, 1996). The researchers reported that as women age their fear of flying increases, however males do not report the same change. Busscher, van Gerwen, Spinhoven, & de Geus (2010) reported that female airline passengers feel greater fear than male passengers.

While clear evidence exists to demonstrate and describe the differences between genders in areas like risk acceptance, expression of emotion, fear of flying, and decision making, the results of this study did not indicate such differences in willingness to fly. The results of this study indicate that gender differences do not play a role in a passenger's willingness to fly. These results suggest that airline marketers need not address male and female aviation consumers in any different ways. As previously discussed, the travelling public needs education about MPL in order to increase its acceptance, however,

according to results in this study, gender difference would not need to be considered.

The third research question which guided this study was "what effect does country of origin of the participant have on willingness to fly?". The null hypothesis associated with this research question was that country of origin does not have an effect on willingness to fly, and the alternate hypothesis was that country of origin does have an effect on willingness to fly.

Results of the ANOVA indicated a significant main effect for country of origin. Respondents from India reported a higher willingness to fly than those from the United States. These results suggest that aviation consumers from India would have a higher willingness to fly and therefore be more likely to fly with a pilot trained under MPL than an aviation consumer from the United States.

Grossman, Ellsworth, and Hong (2011) define culture as a set of knowledge and experiences that are "produced, disseminated, and reproduced among a network of interacting individuals" (p. 1), and Traindis (1996) defines culture as "a pattern of shared attitudes, beliefs, categorizations, self-definitions, norms, role definitions, and values that is organized around a theme that can be identified among those who speak a particular language, during a specific historic period, and in a definable geographic region" (p. 408). According to Roth and Romeo (1992), country of origin pertains to perceived economic development level.

A significant comparative tool is Hofstede's (1980, 2001) Cultural Values Index. Using this index, India can be categorized as a collectivistic society, while America is considered an individualistic society. According to Rice et al. (2014) India can also exhibit characteristics of an individualistic society. A characteristic of a collectivist society is that of trust of others without the need to question or doubt. Individualistic cultures, as is the United States, are characterized by aggression and zeal, people are encouraged to stand up for their beliefs and challenge differing views (Mehta, 2014). According to Mehta et al. (2014), people from individualistic cultures like the United States, are more concerned with themselves and their own well-being. These cultural characteristics may explain the main effect found for country of origin. The higher willingness to fly rating of Indian respondents may be a result of their cultural trust of others and, as Rice et al. (2014) reported, that persons from India tend to conform, they do not challenge the status quo, they do not rebel while the American's lower rating may be as a result of their concern for their well-being.

Another possible explanation is that of uncertainty avoidance. As reported by Rice et al., (2014), uncertainty avoidance is "the extent to which a society feels threatened by uncertain and ambiguous situations and tries to avoid them" (p.7). The results may indicate that those from the United States are less likely to accept uncertainty than those from India. According to this

measure, Indians are more likely to take a risk with an ambiguous outcome than Americans.

The findings in this study support previous research conducted in the area of cultural differences. The characteristics of an individualistic society, as in the United States support a lower willingness to fly, whereas the characteristics of a collectivist society, as is India, are in alignment with a higher reported willingness to fly.

The fourth research question that guided this study was, "What interactions are present in the IVs?". The null hypothesis associated with this research question was that there are no interactions present in the IV's. The alternate hypothesis associated with this research question was that there are interactions present in the IV's.

Results of the ANOVA analysis indicated that there was a significant two-way interaction between country of origin and training. This result indicates that the effect of training methodology on willingness to fly depends on the country of origin and vice-versa. As previously discussed, results of this study suggest that aviation consumers from India would have a higher willingness to fly and therefore be more likely to fly with a pilot trained under MPL than an aviation consumer from the United States.

As previously discussed, as measured on Hofstede's Cultural Values Index (1980, 2001), India is considered a collectivistic society and the United States measures as an individualistic society. Characteristics of a collectivistic society include trust of others, and not questioning or doubting others. An individualistic society is characterized by standing up for one's beliefs and challenging differing views.

At the heart of an individual's willingness to place themselves in what they perceive to be a risky situation is the concept of trust. According to Kantsperger and Kunz (2010), trust is recognized as an important mediator in customer relationship marketing. According to Nielsen (2004), for a collaborative relationship to succeed, it must be based in trust. Heyns et al. (2015) explain that trust is a choice. Trust is a factor in interpersonal interactions as well as in consumer-based decisions (Kantsperger and Kunz, 2010).

Competency based training, and therefore MPL training has significant support for its effectiveness and value (Franks, Hay, & Mavin, 2014, Todd & Thomas, 2013, Hodge, 2007, Morcke et al., 2013, Delamare Le Deist & Winterton, 2005). However, MPL is a new concept for pilot training, having been introduced by ICAO in 2006.

Taking the characteristics of collectivistic and individualistic societies into consideration, an argument could be made that the results of this study

support Hofstede's Cultural Values Index (1980, 2001). The higher willingness to fly values of Indian respondents suggests that they were more accepting of and did not question an approved pilot training methodology. Conversely, the American respondents may have been demonstrating the characteristics of an individualistic society when they challenge a new pilot training methodology by reporting less willingness to fly as compared to the Indian respondents. While results of this study support the hypothesis that there would be a difference between types of pilot training, namely that respondents would be less willing to fly on a flight flown by an MPL trained pilot, Americans were less willing to fly than their Indian counterparts.

Research question five asked "does affect mediate the relationship between the IVs and willingness to fly?". The null hypothesis for this research question was that affect does not mediate the relationship between the IV's and willingness to fly. The alternate hypothesis for this research question was that affect does mediate the relationship between the IV's and willingness to fly. The sixth and final research question that guided this study was, "which specific emotions mediate the relationship between the IVs and willingness to fly? The null hypothesis associated with this research question was that there will be no specific emotions that mediate the relationship between the IVs and willingness to fly. The alternate hypothesis associated with this research

question was that there will be at least one specific emotion that mediates the relationship between the IVs and willingness to fly.

Mediation analyses were run on the significant main effects, training and country. The analysis for training revealed that the emotions fear, happiness and surprise were significant mediators between training methodology and willingness to fly. The second mediation analysis conducted on country of origin indicated that happiness was a mediator between country of origin and willingness to fly.

Trafimow, Sheeran, Lombardo, & Finlay (2004) conducted a series of studies that examined the effect of affect and cognition on certain behaviors. The researchers examined if human behaviors tend to be the result of affective control or cognitive control. The study examined this phenomena both between and within participants. "The between-participants analyses showed that affect tends to make more of a contribution than does cognition for more behaviors" (Trafimow, et al, 2004, p. 207). The within-participants study indicated that there are differences between people in this area.

Fishbein's (1980) *theory of reasoned action* suggests that cognition is the determinant in most human behaviors. The theory posits that actions are based on an expectancy-value decision where probability and value of possible outcomes are taken into account. The author recognizes that people may make incorrect assumptions about either probabilities or value of outcomes.

According to Trafimow, et al. (2004), "the theory of reasoned actions assumes that given the assumptions people make, their intentions are the result of a reasoned process" (Trafimow, et al, 2004, p. 208).

Fishbien's theory is countered by Johnston (1999), who posits that affect is more important than cognition in decision making. The author explains that affect is an evolutionary solution to changing environments. The author argued that affect provides meaning to stimuli, and this aids in learning. Trafimow, et al. (2004) described experiments with patients with brain lesions in affective areas of the brain, primarily the frontal cortices and no discernable cognitive deficits. These patients were unable to respond appropriately in social settings and could not make good decisions. The authors conclude that "it is affect that provides the motivational power for behaviours" (Trafimow, et al, 2004, p. 209).

Slovic et al., (2007) examined the role affect plays in decision making. The authors establish the impact that affect has on decision. The authors explain that prior research focused on the cognitive, as opposed to the affective in decision making. They state, "images, marked by positive and negative affective feelings, guide judgment and decision making" (Slovic et al., 2007, p. 1335). The authors explain that the human experiential system is rooted in affect. While cognitive skills are used in making a decision, the decision in question requires time for thought processes. However, reliance on affect and

emotion provides a "quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world" (Slovic et al., 2005, p. 35).

According to Angie, Connelly, Waples, & Kligyte (2011) affect has a significant impact on decision making. Marien, Aarts, & Custers (2012) report that affect effects motivation. Dunn & Schweitzer (2005) presented evidence that affect impacts a person's trust with positive affect increasing trust and negative affect decreasing trust.

Affect can influence decisions regarding safety and risk. According to Baumeister, Vohs, DeWall, & Zhang (2007) and Slovic, Peters, Finucane, & MacGregor (2005), the effect of affect on stimuli while making a risk evaluation decision is significant. A person's emotional state, or affect can have an observable impact on the decision that person makes about a risky situation.

Rice and Winter (2015) examined consumer willingness to fly on flights with different pilot configurations. Included in the researcher's study was the impact affect had on the respondents' willingness to fly as well as what specific emotions mediated their choices. Results in their study demonstrated how affect impacted the respondents' willingness to fly.

The mediation analysis for training indicated that the emotions fear, happiness and surprise mediated between the type of pilot training and the

respondent's willingness to fly. Fear may have acted as a mediating variable because passengers perceived the idea of flying with a pilot who has less flight experience, as the MPL trained pilot would, as risky and thus producing a feeling of fear at the prospect of flying with such a pilot. Passengers value experience. Pilots trained under MPL receive focused training, specific to the airline for which they will fly and the aircraft they will fly. While this training methodology may be an efficient and effective method of pilot training, consumers' perception must be considered. In this case, when considering the choice between traditional path and MPL, the prospect of flying on a flight flown by a pilot trained under MPL causes a higher fear rating.

The mediation analyses for training and country indicated that happiness was a mediating emotion for willingness to fly. Happiness may have acted as a mediating emotion for willingness to fly because passengers felt happy that there is a pilot training methodology that provides more flight experience. As with fear, passengers value flight experience and a pilot training option which produces a pilot with more flight experience may make an aviation consumer happy.

The last mediating variable for training was surprise. This emotion may have mediated between training and willingness to fly because respondents were surprised by the different training methodologies. They may have been surprised by the perceived low experience level of the MPL trained pilots.

Results in this study supported the work of multiple researchers, indicating that affect impacts decision making (Angie, Connelly, Waples, & Kligyte, 2011, Johnston, 1999, Slovic et al., 2005, Trafimow, et al, 2004) and refute the findings of Fishbien (1980). The results of the mediation analysis for this study mirror the results found by Rice and Winter (2015). Affect did mediate the relationship between type of training and country of origin and the dependent variable, willingness to fly with the emotions of anger, fear, happiness and surprise mediating.

Recommendations for Future Research

While the results of this study are of interest and begin to shed insight into consumers' willingness to fly with pilots trained under the two methodologies examined in this study, there is much more to examine in this area. Acknowledging the limitations inherent in this study leads to recommendations for future research. Amazon's® Mechanical Turk® was used to survey the participants. Conducting the same study but using a different sampling strategy which produces a broader selection of respondents would provide more insight into the phenomena examined in this study.

This study examined the responses from only two countries, America and India. Expanding the sampling to more, or all of the world would provide more insight into consumers' preferences and willingness to fly with pilots trained under

the methodologies examined in this study. Culture and its effects on person's behaviors was examined in this study, a study employing a broader population base would have to consider the effects of multiple cultures might have on the results.

While a statistical significance was found to exist between the different training methodologies, a future study might examine at what level of flight experience do aviation consumers have the same willingness to fly. A study may employ the same or similar survey questions as the current study but add a component where respondents were given options of MPL plus 500, 750, or 1,000 hours of flight experience and determine at which level respondents demonstrate the same willingness to fly as traditional training. Such a study may inform the aviation industry at which level of flight experience consumers are most willing to fly.

Limitations and Delimitations

Research studies are impacted by limitations. Limitations can come from multiple sources and while they cannot be eliminated they need to be acknowledged. The first limitation with this study is a matter of generalizability. Because a convenience sample taken from Indian and American users of Amazon's® Mechanical Turk® was used, the results of this study can only be generalized to individuals from those countries who were online at the time the surveys were active. This strategy also excluded individuals who do not have

Internet access. The sampling strategy employed in this study will limit the generalizability to any larger population.

The second limitation associated with this study has to do with the aviation backgrounds of the participants. There is the possibility that some number of the participants will not be aviation consumers. If this is the case, the scenarios will be strictly theoretical for them; they would have no practical experience on an airline flight.

Delimitations represent choices made by the researcher which can have an impact on the results of the study. Delimitations are things the research did or did not do; these are within the control of the researcher. One delimitations in this study is the problem itself. In this study, the effect of training methodology on an aviation consumer's willingness to fly was chosen. There are other areas associated with willingness to fly which could have been addressed. Pilot training methodology was chosen because of the lack of research in this area, particularly for MPL. Another delimitation is the sample. Only participants from India or the United States will be recruited. These two countries were selected for their different cultures. The differences between an individualistic culture, like India, and a collectivistic culture, like the United States, may provide additional insight into the factors that affect an individual's willingness to fly. Another possible delimitation are the instruments being used in this study. The scenarios prepared for the study may be either confusing to the participants, or they may introduce some unintended

bias. The willingness to fly scale, while shown to be valid and reliable may contain some flaws that could cause confusion for the respondents. Finally, the six universal emotions do not receive universal acceptance; there is some disagreement in the literature if these six emotions are truly universal. In the researcher's opinion, the research on the six universal emotions is compelling and demonstrate that Ekman and Friesen's (1971) work has captured a phenomena that is adequately universal.

Summary

The results of this study suggest that aviation consumers have a preference when given the choice between flying on a flight operated by a pilot trained under the traditional path or under MPL. Additionally, the country of origin of the aviation consumer has an effect on their willingness to fly on such a flight. While gender was not shown to be significant, this information can still be useful within the context of a marketing campaign; different campaigns, targeted at either gender would not be required.

Humans are emotional. Emotion can have an influence in the decision making process. The results of this study suggest that emotion, and specific emotions, can influence an aviation consumer's decision regarding the pilot training methodology they prefer.

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Appendix A: Traditional Path v. MPL Path Scenarios

The traditional path of pilot training entails a pilot receiving flight training in airplanes until they accumulate a minimum of 250 flight hours and then building flight time up to approximately 1,000 flight hours.

Imagine a situation where you will be flying on a commercial aircraft from one major city to another. The captain (pilot) in charge of the aircraft was trained under the traditional path. Given this information, please respond to each of the following questions below.

The MPL path of pilot training entails a pilot receiving flight training in airplanes until they have approximately 40 flight hours and then completing approximately 210 hours of training in flight simulators specific to the airline they will fly for and the specific airplane they will fly for the airline.

Imagine a situation where you will be flying on a commercial aircraft from one major city to another. The captain (pilot) in charge of the aircraft was trained under the MPL path. Given this information, please respond to each of the following questions below.

Appendix B: Ekman and Friesen's Universal Emotions

Appendix C: Willingness to Fly Scale

Please respond how strongly you agree or disagree with the following statements:

1. I would be willing to fly on this flight.

Strongly Disagree Disagree Neutral Agree Strongly Agree

2. I would be comfortable flying on this flight.

Strongly Disagree Disagree Neutral Agree Strongly Agree

3. I would have no problem flying on this flight.

Strongly Disagree Disagree Neutral Agree Strongly Agree

4. I would be happy to fly on this flight.

Strongly Disagree Disagree Neutral Agree Strongly Agree

5. I would feel safe flying on this flight.

Strongly Disagree Disagree Neutral Agree Strongly Agree

6. I have no fear of flying on this flight.

Strongly Disagree Disagree Neutral Agree Strongly Agree

7. I feel confident flying on this flight.

Strongly Disagree Disagree Neutral Agree Strongly Agree