WHAT FACTORS PREDICT AN ANESTHESIOLOGIST'S WILLINGNESS TO PROCEED WITH AN ANESTHETIC?

By

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SIGNATURE PAGE

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Abstract

Anesthesiologists are exposed to higher stress levels than many other physician specialties. They are also at an increased risk for developing mental disorders, alcohol and drug dependencies, sleep disturbances, and suicidal ideations. Therefore, the purpose of this dissertation was to explore the factors that predict an anesthesiologist's willingness to proceed with an anesthetic. The current study consisted of two stages. The first stage was developing a regression equation that was used to predict anesthesiologists' willingness to proceed with an anesthetic. During the second stage, additional data was collected to test the model that was developed in the first stage. Six predictors were examined: the number of adverse events experienced by physicians, a recent history of errors, openness, agreeableness, imposter syndrome, and risk-taking. These predictors were tested across four different scenarios. In scenario 1, the significant predictors were imposter syndrome and risk-taking. In scenario 2, the significant predictors were openness and agreeableness. Finally, in scenarios 3 and 4, there were no significant predictors that were included in the final model. Practical applications and future studies are also discussed.

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Chapter One

Introduction

Background and Significance of the Problem

Hospitals are a high-stress environment for patients and their families who rely on healthcare professionals to respond quickly and accurately to various medical difficulties. Although the purpose of hospitals and other clinical offices is to treat, maintain, or prevent a patient's health from deteriorating, it is also important to consider how operating in these dynamic environments impacts the workers who are caring for these patients.

Previous studies have revealed the poor working conditions for healthcare staff caused by long work hours (Ball et al., 2017) and the lack of staff to cover patients (Glette et al., 2017). Most importantly, it has been reported that daily exposure to patients' suffering and death are primary reasons for adverse effects on physicians' mental health (Tempski et al., 2012). A study that examined 212 resident physicians found that at least 13% met standards for post-traumatic stress disorder (PTSD; Klamen et al., 1995). The authors argued that the high prevalence of this disorder among physicians is due to the prolonged stress from traumatic events (Klamen et al., 1995). Furthermore, in 2018 the Physician Workload Survey examined 3,700 physicians from various specialties (e.g., emergency medicine, surgery, primary care) and found that over half (52%) of physicians reported feeling stressed or experiencing increased mental health problems or and high workload (Carpenter, 2018).

In particular, anesthesiologists have been shown to have higher stress levels when compared to other physician specialties (Bruce et al., 1968; Bruce et al., 1974; Lew, 1979). On average, they have approximately 13 years of education, including college, medical school, and 14,000 hours (4-6 years) of postgraduate clinical training (American Society of

Anesthesiologists, n.d.). Prior studies have shown that anesthesiologists are at an increased risk of developing mental disorders, alcohol and drug dependencies, sleep disturbances, and suicidal ideations (Abut et al., 2012; Kumar, 2016; McCue, 1982). These negative effects on anesthesiologists could influence the success of surgeries, their response to trauma incidents, the quality of patient care, and patient survival.

Importance of the Study

The purpose of this study was to explore the factors that predict an anesthesiologist's willingness to proceed with an anesthetic. The overall goal was to create a prediction model that will help anesthesia professionals to understand the individual factors that affect their willingness to proceed with an anesthetic and why. This will help healthcare industry leaders develop and implement interventions that allow these physicians to express their experiences with each other, learn coping strategies, and inquire about external resources that may improve their mental and physical health.

The variable that was measured in this study is an anesthesiologist's willingness to proceed with an anesthetic. Numerous studies have explored willingness in a variety of domains such as aviation (Ragbir et al., 2018), dentistry (Milner, Anania, et al., 2019), ground transportation (Winter, Rice, et al., 2019), urban air mobility (Ragbir et al., 2020), political associations (Jost et al., 2012), sustainability (Rice et al., 2020), economic industries (Kuminoff & Pope, 2014) and mental health (Vogel et al., 2007). The predictors investigated were gender, age, ethnicity, the number of adverse events experienced by physicians, a recent history of errors, physician specialty, personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), imposter syndrome, physician subspecialty, perceived organizational support, and risk propensity, also called risk-taking. Prior research illustrated the effects of all of these factors

on willingness in several industries; therefore, justifying the examination of these predictors (Milner, Walters, et al., 2019; Ragbir et al., 2018; Rice et al., 2020; Walters et al., 2018; Winter, Rice, et al., 2019).

Operational Definitions

1. *Anesthesiologist willingness* was defined as an anesthesiologist's willingness to proceed with an anesthetic. This variable was measured using the average score on the Willingness to proceed with an anesthetic scale adopted from Rice et al.'s (2020) Willingness to Pilot Scale (See Appendix A).
2. *Age* was defined as a participant's age, which was measured in years.
3. *Gender* was defined as a participant's self-identified gender, either male, female, or other.
4. *Ethnicity* was defined as a participant's self-identified ethnicity; either Caucasian, African descent (e.g., African American), Hispanic descent (e.g., Latin America), Asian descent, or other.
5. *The number of adverse events experienced by physicians* was defined as the total number of adverse events the participant experienced within the last three months.
6. *Recent history of errors* was defined as the total number of medical errors made by the participant within the last three months.
7. *Physician specialty* was defined as additional specialty training following an anesthesia residency; either none, cardiothoracic, critical care, neurosurgical anesthesia, obstetric, pain, pediatrics, regional, transplant, trauma, or other. (See Appendix B).
8. *Personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism)* was defined as the participant's psychophysical system that determines behaviors and

thoughts (Allport, 1961). This predictor was measured using participants' scores on the International Personality Item Pool (Mini-IPIP; Goldberg et al., 2006).

9. *Imposter Syndrome* was defined as persistent doubt of one's ability and the overall fear of being exposed as an imposter (Mullangi & Jagsi, 2019). This predictor was measured using participants' scores on the Clance Imposter Phenomenon Scale (Clance & Imes, 1978).
10. *Physician subspecialty* was defined as the total amount of years the participant has been practicing anesthesia.
11. *Perceived organizational support* was defined as an employee's perception of whether the organization cares or values their work and well-being (Eisenberger et al., 1986). This predictor was measured using the Survey of Perceived Organizational Support (SPOS; Eisenberger et al., 1986).
12. *Risk-taking* was defined as making an action that could potentially have negative consequences (Beyth-Marom et al., 1993). This predictor was measured using General Risk Propensity Scale (GRiPS; Zhang et al., 2018).

Research Questions (RQ)

1. RQ1: Are any demographic variables (gender, age, and ethnicity) significant predictors of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?
2. RQ2: Is the physician subspecialty a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?
3. RQ3: Is physician specialty a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

4. RQ4: Is the number of adverse events experienced by physicians a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic under when controlling for all other variables?
5. RQ5: Is recent history of errors a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?
6. RQ6: Are any of the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) significant predictors of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?
7. RQ7: Is imposter syndrome a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?
8. RQ8: Is perceived organizational support a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?
9. RQ9: Is risk-taking a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

Research Hypotheses

Hypothesis 1

H_{01}: Demographic variables (age, gender, and ethnicity) do not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A1}: At least one demographic variable (age, gender, or ethnicity) will significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 2

H_{02}: The physician subspecialty does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A2}: The physician subspecialty does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 3

H_{03}: The number of adverse events does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A3}: The number of adverse events does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 4

H_{04}: Recent history of errors does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A4}: Recent history of errors does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 5

H_{05}: The Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) do not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A5}: The Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) do significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 6

H_{06}: Imposter syndrome does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A6}: Imposter syndrome does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 7

H_{07}: Perceived organizational support does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A7}: Perceived organizational support does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 8

H_{08}: Risk-taking does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A8}: Risk-taking behavior does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Regression Assumptions

Since I planned to use multiple linear regression to analyze the data, it was first important to confirm that the chosen statistical technique was best suited for the study. In order to provide valid results, the design must not violate the eight assumptions for multiple linear regression. The eight assumptions are as follows:

1. Assumption #1: The dependent variable must be continuous.
2. Assumption #2: There must be more than two independent variables.
3. Assumption #3: The study should have independent observations.

4. Assumption #4: A linear relationship must be present between the dependent variable and each of the independent variables.
5. Assumption #5: The data should show homoscedasticity.
6. Assumption #6: The data should not show multicollinearity.
7. Assumption #7: There are no significant outliers in the study.
8. Assumption #8: Verify that the residual errors are normally distributed.

The first assumption stated that the dependent variable must be continuous. The dependent variable for this study was an anesthesiologist's willingness to proceed with an anesthetic, which was measured using a Willingness to Perform Procedure Likert Scale. While Likert Scales are usually considered an ordinal scale of measurement, for the purpose of this dissertation each scale was coded to produce a single number making this an interval scale of measurement (Carifio & Perla, 2008; Joshi et al., 2015). The second assumption explained that the study must have more than two independent variables. This study was examining 16 independent variables, which consist of: gender, age, ethnicity, physician subspecialty, physician specialty, the number of adverse events experienced by physicians, recent history of errors, personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), imposter syndrome, perceived organizational support, and risk-taking.

The third assumption stated that independent observations must take place. Observations in this study were independent from one another as the observation of one independent variable will not rely on or influence another independent variable. This can also be checked using the Durbin-Watson statistic through the Statistical Package for the Social Sciences (SPSS) software. The fourth assumption explained that a linear relationship must be present between the dependent and each of the independent variables. As previously stated, prior research has shown

the effects of all the independent variables used in this study on willingness in multiple industries (Milner, Walters, et al., 2019; Ragbir et al., 2018; Rice et al., 2020; Walters et al., 2018; Winter, Rice, et al., 2019).

The fifth assumption stated that the data should show homoscedasticity. *Homoscedasticity* refers to having the same variance between each of the independent variables, which can be tested by illustrating the residuals scatterplot. The sixth assumption stated that the data should not show multicollinearity. (i.e., two independent variables that are correlated to one another). This assumption can be tested using SPSS through inspection of correlation coefficients and Tolerance/VIF values (Daoud, 2017). The seventh assumption explained that there should be no significant outliers. This can be checked using SPSS, which can detect outliers prior to analyzing the data (Laerd Statistics, n.d.). Lastly, assumption eight stated that we must verify that the residual errors are normally distributed. This was confirmed with a histogram using SPSS.

Limitations & Delimitations

Limitations

There were some limitations to the current study that the researcher could not control. One limitation was that the data was not collected in a traditional controlled laboratory setting but rather sent as an online link to a survey taken at the participant's convenience. Another limitation was the participant sample. Only anesthesiologists from the University of Chicago's Department of Anesthesia and Critical Care within the Biological Sciences Collegiate Division and the University of Florida's Department of Anesthesiology were surveyed. Therefore, the study can only be generalized to academic anesthesiology departments.

Furthermore, the reliability of the data depended on the reliability and validity of the instruments used to measure the predictors. All of the instruments used in the current study have been tested for reliability. Response bias was another potential limitation as all of the participants may not have understood or perceived the question in the same way. One primary example of this is when a participant was asked to choose between "Strongly Agree" versus "Agree." I cannot be sure that every participant acknowledges the differences in these responses equally. Finally, the use of close-ended survey questions instead of open-ended questions could have limited participants' ability to choose the most appropriate answer.

Delimitations

A delimitation to this study was the sole investigation into a specific specialty of doctors (i.e., anesthesiologists within the United States who practice in a large, urban, academic environment). Another delimitation was the choice of examining only gender, age, ethnicity, physician subspecialty, physician specialty, the number of adverse events experienced by physicians, a recent history of errors, personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), imposter syndrome, perceived organizational support, and risk-taking. Other predictors can be investigated in future studies, though these were chosen because of their relationship to the dependent variable (i.e., willingness).

Summary

Chapter one provided an in-depth overview of the primary purpose of this dissertation along with the supporting factors to the importance and applications of this research. The information discussed included: the background and significance of the problem, research questions, hypotheses, regression assumptions, limitations, and delimitations of the current study.

Chapter Two

Review of Related Literature

Introduction

Medical research has a centuries-long history, with the first clinical trial of the modern era taking place in 1747 (Bhatt, 2010). The advancement of preventative and therapeutic treatment (*e.g.*, vaccines) has nearly eliminated some once fatal illnesses and has increased the overall population's life expectancy. For example, the average life expectancy for women during the early 1900s was 49 years, while today, the life expectancy for women is reported to be an average age of 80 years (Roser et al., 2013). There is no doubt that medical progress has had a significant positive impact on the global population's health and will continue to do so in the future.

While understanding patient perceptions, attitudes, and physiological reactions to medical applications or treatment is vital to improving patient care and satisfaction, it is also critical to recognize the mental and physical influences among the doctors (such as anesthesiologists) who make decisions regarding patients' health. Anesthesiologists are exposed to higher stress levels than other physician specialists (Bruce et al., 1968; Bruce et al., 1974; Lew, 1979). Consequently, these professionals have an increased risk of developing mental disorders, alcohol and drug dependencies, sleep disturbances, and suicidal ideations (Abut et al., 2012; Kumar, 2016; McCue, 1982). These negative effects on anesthesiologists could influence anesthesiologists' judgment and decision making, response to critical events, and quality of care, ultimately affecting surgical outcomes and patient safety.

The purpose of this dissertation was to explore the factors that predict an anesthesiologist's willingness to proceed with an anesthetic. The overall goal was to create a

prediction model, which will aid the medical industry in understanding the individual factors that impact anesthesiologists' willingness to proceed with an anesthetic and why. The rationale for each of the factors was explained along with a discussion regarding regression and prediction models as it pertains to this dissertation.

Sources

The sources used for this literature review are consolidated from Google Scholar and Embry-Riddle Aeronautical University's Hunt Library online database. The online database allowed for access to journal articles that were not available in Google Scholar. The databases that were used included Biomed Central, PubMed Central, ScienceDirect, NIH, Health & Medicine, ProQuest Central, Sage, NCBI, and many more. I collected peer-reviewed journal articles, conferences, proceedings, papers, new reports, and online textbooks from these databases. Keywords and idioms related to the predictors included gender, anesthesiologists, risk-taking, willingness, imposter syndrome, perceived organizational support, personality, age, ethnicity, and healthcare.

Dependent Variable: Willingness to Proceed with an Anesthetic

The dependent variable for this study was an anesthesiologist's willingness to proceed with an anesthetic. The scale used to measure the dependent variable was Rice et al.'s (2020) Willingness to Pilot Scale. Although the scale was originally used for pilots, I revised the scale to reflect a willingness to proceed with an anesthetic for physicians (See Appendix A). For example, in the original scale, question 1 states: *"I would be willing to pilot in this situation,"* which was asked following a brief scenario. I removed the word "pilot" and added "willingness to proceed with an anesthetic." The revised question stated: *"I would be willing to proceed with the patient's case in this situation."* The revalidation of the scale was conducted post hoc.

Numerous studies have explored willingness in a variety of domains, such as aviation (Ragbir et al., 2018), dentistry (Milner, Anania, et al., 2019), ground transportation (Winter, Rice, et al., 2019), urban air mobility (Ragbir et al., 2020), political associations (Jost et al., 2012), sustainability (Rice et al., 2020), economic industries (Kuminoff & Pope, 2014) and mental health (Vogel et al., 2007). One study sought to identify the factors that predict passengers' willingness to fly in a fully automated aircraft (Rice et al., 2019). The relevance of this study showed that it is vital to understand passengers' willingness to fly in fully automated aircraft as they are initially funding the technological advancements within airline industries.

Similarly, studies have investigated the public's willingness to support environmentally friendly initiatives, such as green airports (Walters et al., 2018) and the use of biofuels (Winter, Thropp, et al., 2019). Just like an autonomous aircraft, the studies illustrate the need to consider consumer perceptions and attitudes toward advancing technology. That way, designers can better understand what the public is most concerned about and can help to mitigate the weariness of new technology in the future. The significance of willingness can also be seen in the patient perceptions of dental robots as dentists' offices push toward robotic-assisted techniques (Milner, Anania, et al., 2019). Likewise, ground transportation research, specifically pedestrians' willingness to cross in front of fully automated vehicles (Winter, Rice, et al., 2019), has also been examined; and what they found is that pedestrians like passengers on a flight are not comfortable crossing unless they can see a human driver (Winter, Rice, et al., 2019).

Studies in economics have also observed how capitalization potentially impacts the public's willingness to pay (Kuminoff & Pope, 2014). The authors investigated school resources, public goods, local restaurants, and the market for buying and selling houses. They found that capitalization does not reflect how much the public is actually willing to pay for improved

schools, products, and other market areas (Kuminoff & Pope, 2014). Therefore, evaluating the public's willingness to pay, the researchers can highlight this information to help improve underdeveloped districts in many different states. Overall, the philosophy of representing and acknowledging the perceptions and attitudes of potential passengers, consumers, and the general public are important for the development and progression of better systems. Regarding human-centric design, putting the people at the forefront of the design or problem can help develop improved systems, marketing techniques, and educational practices that target the public's concerns.

Justification of Predictive Factors

The current study used 16 different factors that may significantly predict anesthesiologists' willingness to proceed with an anesthetic. These factors were considered because I wanted to focus on internal components that the participant may or may not be aware of. The internal factors consisted of basic demographic information, such as gender, age and ethnicity. Other factors included were the number of adverse events experienced by physicians, recent history of errors, physician specialty, personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), imposter syndrome, physician subspecialty, perceived organizational support, and risk propensity, also called risk-taking. Prior research has illustrated the effects of these factors on willingness in various industries, such as aviation, sustainability, dentistry, ground transportation and urban air mobility (Milner, Walters, et al., 2019; Ragbir et al., 2018; Rice et al., 2020; Walters et al., 2018; Winter, Rice, et al., 2019).

Gender

For this dissertation, gender differences were evaluated in various topics such as performance (Gneezy et al., 2003), willingness (Rice et al., 2019), risk-taking (Byrnes et al.,

1999), self-efficacy (Busch, 1995), and gender perceptions among anesthesiologists (Miller & Katz, 2018). The implications for understanding gender differences and in what settings these changes take place can help mitigate stereotypes and biases.

A study that observed how males and females performed in competitive environments found that regardless of similarities in skillset in non-competitive settings, females still performed less effectively than men when competing. The authors noted that the gender gap is stronger when women compete against men (Gneezy et al., 2003). Moreover, Pomerantz et al. (2002) found gender differences in academic performance and internal distress. Females were more likely to receive better grades and outperform males when given achievement exams. These findings align with Jovanovic and King (1998), illustrating gender differences in performance-based applications.

Gender differences have also been evaluated in terms of willingness. One study examined differences between males and females in their willingness to participate in health screenings (Davis et al., 2012). The study suggested that men were less willing to undergo screening even after the suspicion of a terminal illness. The study also concluded that women were more likely than men to participate in answering general questions and history about their health (Davis et al., 2012). Studies have also investigated gender gaps in willingness to interact or fly and ride in autonomous technologies. Rice et al. (2019) sought to identify the type of individual who would be willing to fly in an autonomous aircraft. The results suggested that gender was significant, in that men were more willing to fly than women.

Similarly, another study of how gender affected the decision to ride in autonomous cars showed that women were less likely than men to ride in vehicles that did not have a human driver (Winter, Rice, et al., 2019). These results also support Milner, Anania, et al.’s (2019)

experiment that found gender to be a significant factor in consumers' willingness to undergo robotic surgeries: Men were more willing to take advantage of this new technology as opposed to women. These differences have also been found in sustainability practices as well. A recent study found that women were more willing than men to pay for sustainable aviation practices (Rice et al., 2019), which supported Winter, Thropp, et al.'s (2019) investigation that identified gender as a predictive factor for paying for sustainable aviation.

Gender differences have also been evaluated in risk-taking activities. Men are generally more likely to participate in risky behaviors than women (Byrnes et al., 1999; Charness & Gneezy, 2012; Eckel & Grossman, 2008). Differences between men and women have historically been found in recreational activities. Men are more likely to gamble and consume larger quantities of drugs and alcohol (Spigner et al., 1993). Still, studies have also shown that females are generally less sensation-seeking than males, whereas males are more likely to engage in risky behaviors that involve physical consequences (Guszkowska & Bołdak, 2010).

Even so, research into gender differences in financial risk-taking indicated women are more likely to purchase insurance; when they do purchase a plan, they are more likely to have purchased a plan that contains full coverage (Powell & Ansic, 1997). Nonetheless, researchers found evidence that indicated women and men perceive risk differently (Gustafsod, 1998). The cause of these apparent differences is not only from gender alone but also the factors and stereotypes associated with each gender. Segregation, power, ideologies, and biases have been used to explain the underlying theoretical prospective of gender differences (Gustafsod, 1998).

Overall, women have significantly lower self-efficacy (SE) levels than men (Fallan & Opstad, 2016; Lahdenperä, 2018). A qualitative analysis of gender differences in SE on a Finland university campus (Lahdenperä, 2018) found that, on average, females reported lower

SE ratings than their male classmates. Similarly, another study that investigated SE levels and strength found that males had greater SE levels than females (Fallan & Opstad, 2016). SE strength was described as the level of confidence and personal capabilities of solving a task. Most notably, females had significantly lower SE strength than males (Fallan & Opstad, 2016).

Although there is considerable research concluding that females have lower self-efficacy levels than males, there is also evidence that suggests the level of SE between genders is reliant on many factors, such as framing effects (Tai, 2006), environment (McAuley et al., 1999) and age (Orenstein, 1994). Researchers have attempted to explain the connection between gender roles and SE, which suggests that one's gender ideologies depend on family structures and the environment. The expectation is that individuals must act within their gender norms (Bussey & Bandura, 1999).

In the United States, there are more men than women physicians in anesthesiology, neurology, and almost all surgical specialties (Association of American Medical Colleges, 2020). Women make up only 23% of practicing anesthesiologists, 33% of residency applicants, and 34% of residents (Miller & Katz, 2018). Baird et al. (2015) found that male anesthesiologists made 29% more money than their female equals. These statistics are especially concerning because more women than men are in medical school (Heiser, 2018). Perhaps the largest gender discrimination can be illustrated in surgical areas where only nine percent of women reported never experiencing gender discrimination in their specialty; Thus, showing that more than 75% of women have experienced some form of discrimination due to gender (Bruce et al., 2015). Other related studies have supported this claim indicating that female surgeons received less personal support, decreased career advancements, and fewer leadership opportunities (Capek et al., 1997; Hill & Vaughan, 2013).

Age

Age influences cognitive and physical performance (Mittenberg et al., 1989; Samson et al., 2000). Many studies have demonstrated the effects of aging, such as the changes to the physiological structure of the brain (Harada et al., 2013). Aging is associated with a decrease in reaction time (Deary & Der, 2005), fluctuations in the speed of performance (Welford, 1988), and delayed problem-solving skills (Arenberg, 1982). Although the severity of these changes is more prevalent in individuals over 70 years old, studies show that a decline in cognitive performance can begin after midlife (40-60 years old; Aartsen et al., 2002; Albert & Moss, 1988). When reviewing the population characteristics for licensed physicians in the United States, 22.5% are between ages 50-59, 19.3% are between 60-69, and 10% are over 70 years of age (Young et al., 2017). While changes in cognition are a normal part of the aging process, it is important to consider the potential cognitive and physical impacts on the working population, especially physicians working in dynamic environments such as anesthesiologists.

Ethnicity

Ethnicity is an important factor to consider because it can influence perceptions and attitudes (Piekut & Valentine, 2016). Ethnicity plays a crucial role in willingness and risk (Mehta et al., 2017; Ragbir et al., 2018), as well as self-efficacy (Sarkar et al., 2006). Studies that investigated differences between American and Indian participants and their willingness to fly in autonomous aircraft found that Americans were more likely to fly than Indian participants (Mehta et al., 2017). The study also aligns with another (Ragbir et al., 2018) study showing similar differences in American and Indian participates regarding flight distance and flight time in autonomous aircraft.

The authors explained that one reason for this significant difference is the individualistic philosophy of Americans and the collectivist ideology of Indians participants (Pollitt, 1994). In addition, Peguero and Shaffer (2015) found that ethnic minorities had lower SE self-rated scores than other ethnic categories. There has also been substantial research in the treatment of physicians of ethnic minorities that shows these physicians experienced additional difficulty getting hospital posts and endured obstacles due to their ethnicity (Esmail & Everington, 1993).

Number of Adverse Events

The number of adverse events refers to potential complications experienced by physicians, such as airway complications, cardiac arrest, major morbidity or perioperative mortality. Dr. Keith Ruskin, Professor of Anesthesia and Critical Care, describes the nature of medicine as unpredictable (K. J. Ruskin, personal communication, October 12, 2020), where "might not have a successful outcome" regardless of the optimal performance carried out by physicians or medical staff (K. J. Ruskin, personal communication, October 12, 2020). Most importantly, if a physician experiences several adverse events within a short period, the physician may second guess themselves and begin to think, "Is it me or the patient?" These previous experiences could potentially influence future operations or willingness to provide care. Therefore, it is valuable to the medical community to investigate if the number of adverse events experienced by physicians predicts an anesthesiologist's willingness to proceed with an anesthetic.

Recent History of Errors

Studies have investigated physician responses to their own medical errors and the errors of others (Rowe, 2004; Stangierski et al., 2012). Rowe (2004) argued that the system does not properly prepare physicians for dealing with medical errors, which can lead to adverse effects,

such as ignoring an error, blaming others, and desensitization. Stangierski et al. (2012) explained that burnout causes some medical errors. Physicians who experience a medical error may subsequently feel extreme remorse and suffer from a lack of professional satisfaction after realizing an error has been made (Stangierski et al., 2012). Furthermore, the negative impacts of medical errors on physicians include fear of making the same mistake again, increased vigilance, degraded patient-doctor relationships, and loss of social trust (Stangierski et al., 2012). Because of these negative consequences, physicians should be taught positive coping skills such as participation in support groups, which could alleviate the internal stress physicians will inevitably experience during their careers.

Physician Specialty

Several studies have examined the factors that contribute to a physician's choice of specialty. Kassebaum and Szenas (1994) found that lifestyle and personality variables influenced specialty choice of 8,128 medical students. Another related study found that intelligence, career opportunities, and ability preference were among the highest factors that attracted medical students towards a specific specialty (Chang et al., 2006). Similarly, another study found that residents' choice was dependent on gender and year of graduation (Van der Horst et al., 2010).

Woolf et al. (2015) studied how medical school influenced specialty choice by physicians and found that the factor contributing most to medical students' choice was their experiences with school and their instructors. Nonetheless, physician specialty may influence whether the physician may feel comfortable managing a particular patient. For example, a cardiac anesthesiologist, who may mostly care for adult patients with senior residents, may choose not to perform a procedure on a two-month-old infant.

Imposter Syndrome

Clinical psychologists Pauline Clance and Suzanne Imes first used the term *imposter syndrome* (IS), also called *imposter phenomenon*, to describe the successful women who participated in individual psychotherapy with them (Clance & Imes, 1978). They explained that, regardless of their individual accomplishments attained, the women still felt as if they were "imposters." The authors described IS as the internal belief that one is not smart enough and have tricked everyone into believing otherwise (Clance & Imes, 1978). An accepted definition of IS is the persistent doubt of one's ability and the overall fear of being exposed as an imposter (Mullangi & Jagsi, 2019).

Women are more likely to experience IS (Clance & Imes, 1978; Ivie et al., 2016) and more studies suggested that IS is greater in high achieving individuals, as well as minorities (Dickerson, 2019; Mullangi & Jagsi, 2019). This can be seen in the relatively high drop-out rates from individuals in fields in which they are underrepresented, such as science, technology, engineering, and mathematics (Allen-Ramdial & Campbell, 2014; Chrousos & Mentis, 2020). Furthermore, IS has been shown to increase the risk of mental disorders, psychological and emotional distress, anxiety, and depression (Chrousos & Mentis, 2020; Sonnak & Towell, 2001).

In a systematic review, Bravata et al. (2020) identified more than 60 peer-reviewed publications aimed toward IS, with the majority occurring within the last six years. There is also a significant relationship between IS and burnout; IS has been identified in individuals experiencing burnout (Mullangi & Jagsi, 2019). The earlier studies on IS investigated only women because women are treated differently in predominately male industries (Eagly, 2016), must work harder to get a promotion (Ibarra et al., 2010), and are paid less than men, even when

performing the same job (Winter, 1983). The intensive work environment poses a risk factor for developing IS or IS-related symptoms.

Although IS is prevalent among women, more current research suggests that IS also occurs in males (Badawy et al., 2018). A recent study examined the gender differences of IS and found that men experience more physical anxiety symptoms than females (Badawy et al., 2018). In addition, males' performance decreased when given negative feedback as opposed to their female counterparts. Therefore, future research should further explore the differences between men and women who experience IS to understand better how gender may play a role in its psychological impact on these individuals.

The impact of IS among minorities has also been studied (Peteet et al., 2015). For example, one study of IS among ethnic minority students found that psychological well-being, first-generation college status, and ethnic identity were among the top three predictors of IS (Peteet et al., 2015). Similar to the results found in women who experience IS, ethnic minorities felt that they had to work harder to prove themselves and displayed psychological and physiological distress while pursuing an education (Bravata et al., 2020; Peteet et al., 2015).

A high prevalence of IS occurs in physicians (Bravata et al., 2020). LaDonna et al. (2018) explained that medicine is considered an elite career choice, and the perfectionist attitude maintained by most doctors leads to a relationship between self-worth and achievement. In addition, Henning et al. (1998) found that 30% of medical, dentistry, nursing, and pharmacy students scored as imposters. A more recent study examined IS among 138 American students and found that a quarter of male medical students and almost half of female medical students experience IS (Villwock et al., 2016). This study also aligns with Qureshi et al. (2017), who

conducted a similar investigation but targeted Pakistani medical students. The results suggested that 47.5% of the students experienced IS.

IS is prevalent among medical professionals, and a deeper understanding is urgently needed. While the literature on the impact of IS has been explained in general terms (Clance & Imes, 1978; Mullangi & Jagsi, 2019; Sonnak & Towell, 2001), more research is needed to understand all the factors that contribute to IS. Increasing awareness of IS will permit the development of programs, educational resources, and support groups that can help to alleviate the psychological stress felt by physicians.

Physician sub-specialty

Medical education begins with the completion of a bachelor's degree and then matriculation into medical school. Throughout medical school, students shadow physicians and assist them with their patients (Kotrodimos, 2019), taking on increasing levels of responsibility. After graduation, the new doctors must complete an internship and residency training in their chosen specialty and possibly a sub-specialty fellowship before practicing independently. A medical intern is a term used to describe these new doctors in their first year of residency. Following the completion of interning, the new doctor is known as a resident, during which the doctor will choose a specialty. For anesthesiologists in the United States, residency is four years (Marinelli, 2019). Once the physician completes his or her residency, he or she may work independently and oversee his or her own medical team (Marinelli, 2019).

Senior physicians may learn to cope with the intensive healthcare environment after years of practice; however, trainees are especially vulnerable and have an increased risk of developing mental disorders (Bore et al., 2016) and suffer degradation of their quality of life (Tempski et al., 2012). Several studies have evaluated physicians in training and the stress associated with the

endeavor to become an MD (Bore et al., 2016; Dyrbye et al., 2014; Gottlieb et al., 2020; Tempski et al., 2012). A qualitative study that provided self-assessments to medical students about their quality of life showed that students' competition, high workload, and dedication to school decreased their quality of life (Tempski et al., 2012). The authors also highlighted that the main concerns of these students were the consistent contact with death and suffering. Another study found that medical students had a low rate of anxiety and depression when starting their training (Dyrbye et al., 2005), but this steadily increased as they proceeded through the program (Yusoff et al., 2013).

Dyrbye et al. (2014) compared the differences of burnout between medical students, residents, and early attending physicians and found that medical students experience higher rates of depression and suicidal ideation than residents and early attending physicians (Dyrbye et al., 2014). Nonetheless, one study identified that gender, personality, social support, and emotional resilience were among the top predictors of psychological stress in students (Bore et al., 2016).

Personality

Personality characteristics can influence our behaviors, thoughts, and emotions. Personality has been studied for centuries and can be dated back to as early as the fifth century BC (Kavirayani, 2018). The definition of personality varies, depending on which psychosocial theory is being assessed. American psychologist Gordon Allport introduced one acceptable definition of personality (Allport, 1961; Kavirayani, 2018). He described personality as the psychophysical systems that operate inside each of us individually that essentially determine our behaviors and thoughts (Allport, 1961). Many theories have sought to understand personality from behavioral (Skinner, 1935; Watson, 1913), psychodynamic (Freud, 1923), trait (Eysenck, 1987), and humanistic (Maslow, 1981) perspectives.

There are many assessments used to measure personality, with some more reliable and valid than others. Objective personality tests are commonly used as the self-report measure gives an individual the freedom to respond without the researcher's influence (Paunonen, 1984). Some frequently used self-reported measures are the Myers-Briggs Type Indicator (MBTI) (Myers, 1962), Neo Pi-R (Costa & McCrae, 1985), the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1964), and International Personality Item Pool (Goldberg, 1992). The MBTI assessment is commonly used and was initially developed to help people understand more about themselves and to help them find what occupation supports their personality type (Kreienkamp & Luessenheide, 1985). The MBTI consists of four scales: extraversion/ introversion, sensing/ intuition, thinking/ feeling, and judging/ perceiving (Carlyn, 1977). One key distinction between the MBTI and other personality scales is that it offers insight into the uniqueness of your personality.

One of the most accepted personality models in psychology is the Big Five personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), a concept which many personality measures have adopted (e.g., Neo Pi-R). The model is the result of contributions from many researchers in personality (Vinney, 2018). As mentioned before, the five factors within the model are openness, conscientiousness, extraversion, agreeableness, and neuroticism.

The Neo Pi-R is a revised inventory that highlights individual personality traits, such as interpersonal and emotional characteristics (Costa & McCrae, 2008). The Neo Pi-R includes the five major domains of personality and the facets along with each of the Big Five Factors: openness, conscientiousness, extraversion, agreeableness, and neuroticism (Costa & McCrae, 1992). Clinicians, counselors, or psychologists can use the instrument to understand the

individual characteristics of a particular person (Costa & McCrae, 2008). Studies aimed towards understanding personality disorders in clinical settings have adopted the Neo Pi-R, which helped determine various links between the Diagnostic and Statistical Manual (DSM – 5) dimensions of personality disorders and diagnoses (Costa & McCrae, 1990)

The Eysenck Personality Questionnaire was created to measure extraversion and neuroticism, two dimensions of personality (Eysenck & Eysenck, 1993). The revised version of the personality instrument measures a third component, psychoticism, which tests those likely to partake in risky behavior (Francis et al., 1992). Similar to the aforementioned instrument, the Eysenck Personality Questionnaire is most widely used to help in clinical assessments identifying mood disorders (Peluso et al., 2007).

Like the Neo Pi-R, the International Personality Item Pool (IPIP) tests markers from the Big Five as well (openness, conscientiousness, extraversion, agreeableness, and neuroticism; Goldberg, 1992). The IPIP consists of more than 2,000 items, with more items being added each year (Goldberg et al., 2006). It was developed to allow the public and researchers to use it freely since copyrighting issues and scoresheets to the personality tests were unavailable (Buchanan et al., 2005). The IPIP website provides everyone with psychometrics regarding the scales and scoresheets for each scale and the raw data for replication of studies (Goldberg et al., 2006).

Personality has been shown to influence an individual’s decisions, thoughts, and actions (Barrick et al., 2001; Kopala-Sibley & Santor, 2009). Studies of healthcare workers have consistently shown that two components contribute to physicians' performance: cognitive abilities and noncognitive abilities (Gonnella et al., 1993, 1998; Hojat et al., 2013). The focus is on the noncognitive abilities, which are the personal characteristics of the physician, such as values, attitudes, personality, and interests (Gonnella et al., 1993, 1998). A study looking at

physician performance reported that cognitive abilities accounted for only 35% of the variance in performance (Giddins, 1987). An extroverted personality has been shown in the literature to be common among physicians' problem-solving styles and decisiveness (McCulloch et al., 2005; Westin et al., 1986).

Furthermore, Ferguson et al. (2002) sought to identify the factors related to success in medical school and found personality among others to be a significant predictor. Similarly, a longitudinal and worldwide study of those in medicine found that specific groupings of personality were correlated with higher levels of stress; Particularly neuroticism and high conscientiousness (Tyssen et al., 2007). Lievens et al. (2002) examined what personality traits are common among medical students, and the results indicated that extraversion and agreeableness factors were among the highest scores. The study also suggested that conscientiousness (*i.e.*, self-discipline) is a significant predictor of success during pre-clinical years. A more recent study found a relationship between physicians' personality and their individual risk perceptions (Bogacheva et al., 2020).

Studies correlating anesthesiologists' stress with personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism) have shown a higher risk of burnout, which has led to a decrease in clinical performance (van der Wal et al., 2018). Nevertheless, other studies have shown differences in personality profiles between anesthesiologists and physicians of other specialties, highlighting a potential relationship between personality traits and the high prevalence of drug addiction and suicide in anesthesiologists (Kluger et al., 1999; Weeks et al., 1993). Research into understanding how personality plays a role in medical decisions is progressing. We know now the influence

personality has on medical students' success in medical school, physicians' mental health, and overall medical workers' performance.

Perceived Organizational Support

Perceived organizational support (POS) has been linked to employee performance (Kurtessis et al., 2017), satisfaction (Barber et al., 1992), stress level (Shaw et al., 2013), and well-being (Eisenberger et al., 2016). POS was first coined by Eisenberger et al. (1986) when managers started to become concerned with employees' commitment to their job or organization. POS is defined as the employees' perception of whether the organization cares or values their work and well-being (Eisenberger et al., 1986). Rhoades and Eisenberger (2002) conducted a comprehensive literature review on the effects of low and high POS on employees. The authors found that employees expressed that fairness, supervisor support, organizational rewards, and favorable job conditions were among the top four benefits from organizations. Furthermore, studies have shown that low job satisfaction and low self-worth have been connected to those who measure low in POS (George & Brief, 1992).

POS also influences employee performance (Byrne & Hochwarter, 2008; Kurtessis et al., 2017). One study tested 1,256 employees from various industries to examine the relationship between POS and performance (Byrne & Hochwarter, 2008). Employees who scored low on POS felt that the organization they worked for were disloyal, untrustworthy, and cared little for their personal well-being. Furthermore, those individuals also performed less work, only performing what is minimally necessary (Guastello et al., 1992).

Conversely, employees who scored high on POS felt that the organization they worked for promoted a safe working environment, offered employee benefits, and allowed room for growth (Eisenberger et al., 1986). The employees were more likely to attend work following an

injury (Shaw et al., 2013) and more likely to exceed performance expectations (Lynch et al., 1999). POS also correlated with burnout (Eisenberger et al., 1990) and self-efficacy (Caesens & Stinglhamber, 2014). Researchers measure POS by using the Survey of Perceived Organizational Support (Eisenberger et al., 1986). The original measure consists of 36 items asking how respondents strongly agree or disagree with the statements. A validated and reliable abbreviated version follows the same guidelines but has only eight questions (Eisenberger et al., 1997).

Since high POS has been shown in the literature to increase job commitment (Eisenberger et al., 1986; Panaccio & Vandenberghe, 2009), many studies have investigated the influence POS has on medical staff (Mahmoud, 2008; Patrick & Laschinger, 2006; Sumathi et al., 2015), as this occupation requires long-standing professional dedication. A study examining the effects of removing chief nursing staff (i.e., eliminating power to lead nurses) found that POS decreased in the following months after the change was implemented (Patrick & Laschinger, 2006). The authors highlighted that the differences were noted in affect (i.e., moods of the nurses) and performance.

Another study evaluated job satisfaction in nurses, and the results suggested that job satisfaction was correlated to POS and commitment (Mahmoud, 2008). A more comprehensive study evaluated the level of support from human resources, fellow workers, and supervisors these workers perceived within hospitals (Sumathi et al., 2015). The results suggested that healthcare workers valued support that included higher pay, rewards, job autonomy, and positive supervisory support (Sumathi et al., 2015).

Risk-Taking

For decades, researchers have examined the role of risk-taking and how it influences behavior and decision-making (Beyth-Marom et al., 1993; Slovic et al., 2005). Risk-taking has

been described as making an action that could potentially have negative consequences (Beyth-Marom et al., 1993). The exploration into risk research has several perspective theories, such as cognitive (Palich & Bagby, 1995), emotional (Panno et al., 2013), and social (Willoughby et al., 2014) philosophies that help to explain the development of risk-taking in individuals. Risk behavior has also been evaluated in various fields just as finances (e.g., gambling), extreme sports (e.g., free solo climbing, BASE jumping) (Brymer, 2010), developmental psychology (Steinberg, 2008) (e.g., risk-taking in adolescents) and healthcare (Arfanis et al., 2011).

Several instruments are used to measure risk-taking orientations, some of which include the domain-specific risk-taking (DOSPERT) Scale (Blais & Weber, 2006), the Risk-Taking Index (Nicholson et al., 2005), and the General Risk Propensity Scale (GRiPS) (Zhang et al., 2018). The DOSPERT scale assesses risk in five high prevalent areas: finances, health, ethics, social, and safety. Though, the versions of the scale vary depending on which domain is being observed (Blais & Weber, 2006). Similarly, the Risk-Taking Index examines the same components as the DOSPERT; however, this scale also includes career risks. One difference between this instrument and others is that the scale assesses risk-taking in the present and past.

The Risk-Taking Index contains six items asking the respondent to rate how often they would participate in the specific activity now and in the past (Nicholson et al., 2005). The GRiPS is a recently developed scale that focuses on an individual's overall risk-tasking philosophy regardless of domain. The instrument contains eight questions where the respondent must strongly agree or disagree. The authors argued that using this scale will help predict work and life outcomes better than other risk-taking scales such as the DOSPERT (Zhang et al., 2018).

Excessive gambling has been shown to cause psychological, social, and biological problems in people who frequently participate in this risky behavior (Shaffer et al., 1999)—so

much so that the DSM – 5 includes pathological gambling as an impulse-control disorder (American Psychiatric Association, 2013). Impulsivity has been illustrated in the literature as a personality characteristic that relates to and influences pathological gambling (Hodgins & Holub, 2015). Considerable research has also linked risk propensity to personality traits arguing that the influence of personality has been a strong predictor in risk-taking rather than the environment (Highhouse & Yüce, 1996; Zuckerman & Kuhlman, 2000), which contradicts literature from prospect theory which indicates that risk-taking relies on environmental situations (Kahneman & Tversky, 2013). Within extreme sports, the risk is more focused on physical danger, while other domains may focus on potential losses that may not be life-threatening. Theoretical perspectives have been developed to help to explain those who participate in extreme sports and explore the motivation behind performing these behaviors (Laurendeau, 2008).

Nevertheless, developmental psychology perspectives of risk aim to understand the evolving components of risky behaviors from children to adulthood. It has been argued that developing the tools necessary for understanding risk is reliant on two important skills: knowing what defines a risky situation and the discipline is to avoid risks that have high negative consequences (Byrnes, 2013; Mann et al., 1989). It is well-established that risky behaviors develop and peak between 12-18 years old (Arnett, 1999; Gullone et al., 2000; Rai et al., 2003). Though, it is still important to note that while adolescents are more likely to participate in risky behaviors that may impact overall health (e.g., smoking) (Tymula et al., 2012), adults are more likely to engage in risky financial decisions (Rolison et al., 2014).

What separates risk research in healthcare is the focus on how the medical staff's risk-taking philosophies could influence patients' health outcomes and fatalities. A recent study conducted by Pikkel et al. (2016) sought to answer one question: Are doctors risk-takers? The

authors assessed physicians of all specialties, including surgeons, pediatricians, and anesthesiologists. The results suggested that surgeons and anesthesiologists displayed greater risk-taking tendencies as compared to other specialties. The authors highlighted that one reason for this outcome could be because these physicians do not have the journey of gathering information regarding patients' diagnoses but instead must focus on a particular task (Pikkel et al., 2016). Another study explored the effects of sleep deprivation among junior doctors working the night shift and found that risk-taking was more prevalent in doctors working the night shift than those who worked during the day (Capanna et al., 2017). The authors explain that the motivation behind conducting this study was the jarring literature on the negative consequences of sleep deprivation, which has been shown to influence decision-making, information processing, and clinical performance (Lockley et al., 2007; Weinger & Ancoli-Israel, 2002).

Regression and Prediction Models

The aim of this dissertation was to develop a prediction model for anesthesiologist's willingness to proceed with an anesthetic. The 16 factors that may be significant to the model were gender, age, ethnicity, the number of adverse events experienced by physicians, a recent history of errors, physician specialty, personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), imposter syndrome, physician subspecialty, perceived organizational support, and risk-taking. The rationale for each factor's significance has been explained in detail in the previous sections. Now, I will present literature that has used a similar methodology to further support the motive for using regression and model fit in this dissertation.

Many studies have used regression analysis to predict and understand human behavior. Some studies have examined willingness to operate and interact with driverless vehicles (Hampshire et al., 2020; Milner, Walters, et al., 2019; Winter, Rice, et al., 2019) fully

autonomous aircraft (Ragbir et al., 2020; Ragbir et al., 2018; Rice et al., 2019), and robotic-assisted surgery (Anania et al., 2020; Milner, Anania, et al., 2019). Studies have also investigated individual factors that may be used to predict various outcomes of human behavior. For example, several studies have found that certain personality traits predict job satisfaction (Furnham et al., 2002), intelligence (Moutafi et al., 2005), and stress (Iacovino et al., 2016). In addition, regression analysis has also been used in marketing to predict factors that influence the public's decision to shop online (Vijayasarathy, 2004).

Regression analysis has also been valuable in healthcare. One study sought to identify what type of doctors and patients prefer direct-to-consumer advertising regarding prescription medications (Gönül et al., 2000). Another study examined which factors influenced doctors' understanding of how patients feel regarding their health (Lukoschek et al., 2003). Ayatollahi et al. (2013) used regression to understand the predictors that influenced emergency room physicians' attitudes towards new technology. Armstrong (2017) evaluated the factors that predict physicians' choice to practice in rural areas. Interestingly, one study focused on improving the accuracy of medical procedure time predictions by using regression models based on estimated surgeon-controlled time (Edelman et al., 2017). A more recent study investigated various factors that influenced Australian physicians' choice to give patients novel oral anticoagulants to prevent strokes (Zhang et al., 2019).

The purpose of this dissertation was twofold. The first stage of this research study consisted of developing a regression equation to predict an anesthesiologist's willingness to proceed with an anesthetic. The second stage consisted of an additional data collection process to test the model developed in the first stage. Because this dissertation encompassed several

significant variables and sought to build a prediction model, multiple linear regression was considered the most suitable statistical technique to implement (Harrell, 2015).

Summary

Chapter 2 provided a review of the significant predictors that were used in this dissertation. The predictors have been shown to influence individuals', physicians', medical staff, and medical students' thoughts, attitudes, and behaviors. While completing the literature review, a gap in research among anesthesiologists was apparent. The current research study aimed to address this gap in the literature and predict anesthesiologists' willingness to proceed with an anesthetic. Chapter 3 provided the detailed research methodology used in this dissertation, including information regarding the population of interest, sample, instrumentation, procedures, variables, design, and statistical analysis tools. The methodology in Chapter 3 was thorough in order for the study to be easily replicated.

Chapter Three

Methodology

Introduction

This chapter will discuss the research design and methodology used in this research. The present section will include:

1. A description of the proposed research design and rationale.
2. Target population and sample.
3. A priori power analysis.
4. Variables.
5. The data collection process and instrumentation.
6. The statistical procedure for data analysis, and;
7. Human-subject considerations (i.e., participant protection and confidentiality).

Research Design and Rationale

A quantitative approach with a survey-based correlational design was best suited for this current study. A correlational design, combined with multiple regression, helped discover and recognize the factors that influenced an anesthesiologist's willingness to proceed with an anesthetic. Analysis of Variance (ANOVA) and *t*-tests, which are other statistical techniques, are not appropriate for this research study as they explore differences between groups, and I have a primary goal of developing a prediction equation. I used a survey-based correlational design with multiple linear regression as the statistical procedure for the data analysis.

Research Questions (RQ)

RQ1: Are any demographic variables (gender, age, and ethnicity) significant predictors of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ2: Is the physician subspecialty a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ3: Is physician specialty a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ4: Is the number of adverse events experienced by physicians a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ5: Is recent history of errors a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ6: Are any of the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) significant predictors of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ7: Is imposter syndrome a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ8: Is perceived organizational support a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

RQ9: Is risk-taking a significant predictor of an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables?

Research Hypotheses

Hypothesis 1

H_{01}: Demographic variables (age, gender and ethnicity) do not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A1}: At least one demographic variable (age, gender, or ethnicity) will significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 2

H_{02}: The physician subspecialty does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A2}: The physician sub-specialty does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 3

H_{03}: Physician specialty does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A3}: Physician specialty does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 4

H_{04}: The number of adverse events does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A4}: The number of adverse events does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 5

H_{05}: Recent history of errors does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A5}: Recent history of errors does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 6

H_{06}: The Big Five personality traits (openness, conscientiousness, extraversion, agreeableness and neuroticism) do not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A6}: The Big Five personality traits (openness, conscientiousness, extraversion, agreeableness and neuroticism) do significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 7

H_{07}: Imposter syndrome does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A7}: Imposter syndrome does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 8

H_{08}: Perceived organization support does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A8}: Perceived organization support does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 9

H_{09}: Risk-taking does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

H_{A9}: Risk-taking does not significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Population and Sample

Population

With the goal of creating a prediction model to explore factors that predict an anesthesiologist's willingness to proceed with an anesthetic, the main target population for this survey was anesthesiologists. It is imperative to understand the factors that influence anesthesiologist's willingness as it could potentially impact the success of surgeries, response to trauma incidents, the quality of patient care, and ultimately patient survival.

Sample

Unfortunately, it is not feasible to collect data from every anesthesiologist in the United States. Therefore, anesthesiologists from the University of Chicago's Department of Anesthesia and Critical Care and the University of Florida's Department of Anesthesiology were collected.

A Priori Power Analysis

An *a priori* power analysis was conducted using the program G*Power 3.1.9.7 to compute the analysis. The purpose of conducting a power analysis before beginning the study was to learn how many participants are needed to detect an effect, if an effect is present, and ensure the results' validity (Liu, 2014). Entering a total of 18 predictors, a large effect size of 0.35, an alpha level of significance of 0.05, and a power (beta) of .80 into G*Power determined that each stage would need 74 participants. As stated in earlier sections, this research study

incorporates two stages: developing the regression equation and then testing the model to ensure validity. Each stage required a minimum of 74 participants; thus, a total of 148 participants was needed.

Research Methodology

Participants were recruited from the University of Chicago's Department of Anesthesia and Critical Care and the University of Florida's Department of Anesthesiology. Anesthesiologists and anesthesia residents received the survey online via Google Forms ® and were first asked to participate in the study. Then they were asked to read the instructions, which stated, *"You will be asked some demographic questions and other questions regarding your individual characteristics. Following these questions, you were presented with scenarios regarding potential medical procedures then asked some questions about it. The data collection process is anonymous, and your responses will remain confidential."*

The study consisted of two stages, which used the same survey but different samples to test the validity of the prediction model in the second stage. Overall, the survey began with demographic questions on gender, age, ethnicity, physician subspecialty, physician specialty, the number of adverse events that they experienced, and recent history of errors (See Appendix B). Following their responses to the demographic questions, the International Personality Item Pool Scale (See Appendix C), the Imposter Phenomenon Scale (Appendix D), Perceived Organizational Support Scale (See Appendix E), and the General Risk Propensity Scale (See Appendix F) were completed. The order of all the scales and the questions within the scales was randomized using the option function on Google Forms ®.

Subsequently, the participants were shown four medical scenario prompts written by experienced anesthesiologists. The participants responded to multiple-choice questions regarding

their Willingness to proceed with an anesthetic (See Appendix A) after each scenario (i.e., the participants responded to the scale four times). The order of the scenarios and the questions within the Willingness to proceed with an anesthetic scale was randomized on Google Forms ®. The medical scenarios are as follows:

1. *"A 67-year-old man with a history of esophageal cancer treated with chemotherapy and radiation is scheduled for a right thoracoscopic wedge resection for a pulmonary nodule. During a previous anesthetic about 2 months ago, the patient was found to have significant stenosis of his airway. A 6.0 mm endotracheal tube was the largest tube that could be inserted."*
2. "*An 88-year-old woman who fell at home is scheduled for an urgent hip open reduction and internal fixation. She has a history of severe aortic stenosis with a valve area of 0.8cm^2. Her exercise tolerance is less than 4 METS and she has had a recent syncopal episode."*
3. *"A 54-year-old man with acute appendicitis is scheduled for a laparoscopic appendectomy. He was recently diagnosed with a pheochromocytoma based on significantly elevated plasma metanephrine level. He complains of frequent episodes of headache, chest pain and shortness of breath. He has yet to visit his surgeon and has not yet begun alpha antagonist medications."*
4. *"A 79-year-old woman has a significant history of peripheral vascular disease with claudication and chronic lower extremity wounds. She is scheduled for an urgent femoral to popliteal bypass to avoid a future amputation. She has a history of hyponatremia and carries a diagnosis of inappropriate antidiuretic hormone syndrome. Over the last few*

months, her sodium has ranged from 125-132 mmol/L. Labs today reveal a sodium of 125 mmol/L."

The survey illustrated above (See Appendix F) was the only instrument used to collect data for this dissertation. A new sample was collected for the second stage, but all participants were given the same survey.

Variables

Independent Variables

All the predictors previously discussed are the independent variables that were examined to develop the prediction model. These variables include gender, age, ethnicity, physician subspecialty, physician specialty, the number of adverse events experienced by physicians, a recent history of errors, personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), imposter syndrome, perceived organizational support, and risk-taking.

Gender, physician specialty, and ethnicity were treated as categorical variables and were measured using multiple-choice questions. The recent history of errors and the predictor of the number of adverse events were treated as a ratio scale of measurement; they will also be measured using multiple-choice questions. The physician subspecialty consisted of a multiple-choice style question treated as an interval scale of measurement. Lastly, age was treated as a continuous variable allowing participants to respond freely. Appendix B lists all of the questions.

Personality was split into the Big Five factors: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. The instrument used to measure these personality factors is a 20-item survey called the Mini-International Personality Item Pool (Donnellan et al., 2006). This survey instructs participants to respond to statements representing their personality

characteristics (e.g., “Get upset easily.”). These response options include a range from “Very Inaccurate” (-2) to “Very Accurate” (2) with a zero-neutral option.

The independent variables, imposter syndrome, perceived organizational support, and risk-taking, used Likert-type scales. Imposter syndrome was assessed using Clance and Imes’ (1978) Imposter Phenomenon scale, which consists of 20 questions that asked the respondents to indicate how true each of the statements are (e.g., “At times, I feel my success has been due to some kind of luck.”). The five-point scale ranges from “Not True at All” (-2) to “Very True” (2).

Perceived organizational support was measured using Eisenberger et al.’s (1986) Perceived Organizational Support Scale, where the eight-item survey will ask the respondent to choose the best response for the statements which focus on working at the respondent’s current job (e.g., “Even if I did the best job possible, the organization would fail to notice.”). The scale ranges from “Strongly Disagree” (-3) to “Strongly Agree” (3) with a zero-neutral point. Finally, risk-taking was measured using the participants’ average scores on the General Risk Propensity scale (GRiPS; Zhang et al., 2018). The scale consists of eight questions that ask participants to respond to each of the statements indicating how strongly they agree or disagree with each statement (e.g., “Taking risks makes life more fun.”). The scores range from “Strongly Disagree” (-2) to “Strongly Agree” (2) with a zero-neutral point.

Dependent Variable

The dependent variable for this dissertation was anesthesiologists’ willingness to proceed with an anesthetic (See Appendix A). The scale used to measure the dependent variable was adopted from Rice et al.’s (2020) Willingness to Pilot Scale. In the original scale, question 1 states: “*I would be willing to pilot in this situation,*” which was asked following a brief scenario. I removed the word “pilot” and added “willingness to proceed with an anesthetic.” The revised

question stated: "*I would be willing to proceed with an anesthetic in this situation*." The new Willingness to Proceed with an Anesthetic Scale has six questions, in which the participant responded to how strongly they agree or disagree with the statements. This scale ranges from "Strongly Disagree" (-2) to "Strongly Agree" (2) with a zero-neutral point.

The participants responded to this scale four times following each of the four medical scenarios. For example, participants read the following scenario: *"A 67-year-old man with a history of esophageal cancer treated with chemotherapy and radiation is scheduled for a right thoracoscopic wedge resection for a pulmonary nodule. During a previous anesthetic about 2 months ago, the patient was found to have significant stenosis of his airway. A 6.0 mm endotracheal tube was the largest tube that could be inserted."* Then participants were asked to complete the Willingness to Proceed with an Anesthetic Scale following the scenario.

Data Analysis

Stage 1 of this study was analyzed using multiple linear regression. The second stage involved model fit testing with a separate sample to determine the model's validity. Multiple linear regression was the most suitable technique to examine the factors that influence an anesthesiologist's willingness to proceed with an anesthetic. A correlational design using multiple linear regression helped identify significant predictors used to develop a prediction equation.

Human-Subject Considerations

The Embry-Riddle Aeronautical University's Institutional Review Board (IRB) reviewed the consent form, instruments, survey, and associated materials to ensure that this study followed proper ethical guidelines for human research. No confidential information was collected from participants, and all responses were kept confidential and anonymous. This study consisted of a

survey that was distributed using Google Forms ®. Participants completed the survey at their convenience and in private if they chose. Participants were required to be 18 years or older to take part in the study. Initially, participants were asked a question in which only "Yes" and "No" were given as options to the following question: *"Are you at least 18 years of age?"* If the participant answered "No," then they would automatically be prevented from participating. Survey responses were used only to build and validate the prediction model. The current research study did not pose any risk to the individuals who chose to participate.

Summary

The purpose of this chapter was to provide the proposed methodology for this dissertation. The topics discussed included the research design and rationale for the study, target population and sample, power analysis, and description of the variables. This section also provided information regarding the data collection process and instrumentation as well as the data analysis technique that was used to analyze and interpret the results for this study. Lastly, human-subject considerations were explored, specifically participant eligibility requirements, participants' protection, and legal and ethical considerations.

Chapter Four

Results

Introduction

The purpose of this research was to explore what factors predict an anesthesiologist's willingness to proceed with an anesthetic. The overall goal was to create a prediction model, which will aid the medical industry in understanding the individual factors that impact anesthesiologist's willingness to proceed with an anesthetic and why. Chapter 4 includes the results of the data analysis performed along with descriptive and inferential statistics. All data analyses were conducted using Microsoft Excel and IBM Statistical Package for the Social Sciences (SPSS) software.

General Design

The research study used a survey-based correlational design with multiple linear regression as the statistical procedure for data analyses. The study was conducted in two stages: The first stage consisted of the development of a regression equation that was used to predict anesthesiologist's willingness to proceed with an anesthetic (dependent variable), and the second stage consisted of model fit testing with an additional data collection process to test the model developed in the first stage.

Due to the inability to meet the minimum participant requirements, only six predictors were examined: the number of adverse events experienced by physicians, a recent history of errors, openness, agreeableness, imposter syndrome, and risk-taking. Choosing to focus on these specific predictors was guided by anesthesiologists on the order of importance or relevance in the profession and was completed a priori. A more detailed discussion was presented in the Sample Sizes, Effect Size, and Observed Power section.

Research Tool and Instrument

A 67-item survey was created in Google Forms® in order to collect data and develop a regression equation. The entire survey can be found in Appendix F. The survey begins with demographic questions on gender, age, ethnicity, physician subspecialty, physician specialty, the number of adverse events experienced by physicians, and recent history of errors (See Appendix B). Following their responses to the demographic questions, the participants were presented with five Likert-type scales.

Subsequently, the participants were shown four medical scenario prompts written by experienced anesthesiologists. The participants responded to multiple-choice questions regarding their willingness to proceed with an anesthetic (See Appendix A). The medical scenarios were as follows:

1. *"A 67-year-old man with a history of esophageal cancer treated with chemotherapy and radiation is scheduled for a right thoracoscopic wedge resection for a pulmonary nodule. During a previous anesthetic about 2 months ago, the patient was found to have significant stenosis of his airway. A 6.0 mm endotracheal tube was the largest tube that could be inserted."*
2. "*An 88-year-old woman who fell at home is scheduled for an urgent hip open reduction and internal fixation. She has a history of severe aortic stenosis with a valve area of 0.8cm^2. Her exercise tolerance is less than 4 METS and she has had a recent syncopal episode."*
3. *"A 54-year-old man with acute appendicitis is scheduled for a laparoscopic appendectomy. He was recently diagnosed with a pheochromocytoma based on significantly elevated plasma metanephrine level. He complains of frequent episodes of*

headache, chest pain and shortness of breath. He has yet to visit his surgeon and has not yet begun alpha antagonist medications."

4. *"A 79-year-old woman has a significant history of peripheral vascular disease with claudication and chronic lower extremity wounds. She is scheduled for an urgent femoral to popliteal bypass to avoid a future amputation. She has a history of hyponatremia and carries a diagnosis of inappropriate antidiuretic hormone syndrome. Over the last few months, her sodium has ranged from 125-132 mmol/L. Labs today reveal a sodium of 125 mmol/L."*

Finally, participants were asked a free-response question, which stated, "*Are there any other factors that affect your willingness to proceed with an anesthetic*?*"* The survey instrument was the same for both studies, and participants were recruited from the University of Chicago's Department of Anesthesia and Critical Care within the Biological Sciences Division and the University of Florida's Department of Anesthesiology.

Factor Analysis

A factor analysis was conducted to validate the scale used to measure the dependent variable: an anesthesiologist's willingness to proceed with an anesthetic scale (See Appendix A). The scale used to measure the dependent variable was adopted from Rice et al.'s (2020) Willingness to Pilot Scale. Six questions relating to anesthesiologist willingness were analyzed using principal component analysis with Varimax rotation. Below are the results of the factor analysis for each scenario:

Scenario 1

The analysis showed that each item loaded onto a single factor, illustrating that this model explained 61.4% of the variance. Cronbach's Alpha and Guttmann's Split-Half test was

used to test the internal consistency and reliability of the scale. The Cronbach's Alpha test results showed a value of .870, which indicates high internal consistency between all of the items. The Guttmann's Split-Half-test results showed a value of .858 which also indicates high retest reliability.

Scenario 2

The analysis showed that each item loaded onto a single factor, showing that this model explained 68.9% of the variance. The Cronbach's Alpha test results showed a value of .907, which indicates an extremely high internal consistency between all of the items. The Guttmann's Split-Half-test results showed a value of .888, which indicates high retest reliability.

Scenario 3

The analysis showed that each item loaded onto a single factor, illustrating that this model explained 75.7% of the variance. The Cronbach's Alpha test results showed a value of .934, which indicates an extremely high internal consistency between all of the items. The Guttmann's Split-Half-test results showed a value of .947, which also indicates high retest reliability.

Scenario 4

The analysis showed that each item loaded onto a single factor, showing that this model explained 60.9% of the variance. The Cronbach's Alpha test results showed a value of .868, which indicates high internal consistency between all of the items. Finally, the Guttmann's Split-Half tested results showed a value of .858, which also indicates high retest reliability.

Descriptive Statistics

The study was conducted in two stages. The first stage of this research study consisted of developing a regression equation to predict anesthesiologists' willingness to proceed with an

anesthetic. The second stage consisted of an additional data collection process that was used to test the model developed in the first stage. The total sample size included 101 participants.

Missing and Excluded Data

If participants did not respond to all the personality questions within the Mini-IPIP scale, they were removed for both stages. This scale sums the scores rather than averages and would not represent an accurate final score if data was missing. Similarly, they were removed if participants did not respond to two or more questions within the other scales (Clance Imposter Phenomenon Scale, Willingness to Proceed with an Anesthetic Scale and GRiPS). Furthermore, if participants missed the history of medical errors and adverse events questions, the average was used as the final score. Mahalanobis Distance was used for detecting outliers, and, when using this method, all responses must be answered (i.e., no missing data) to accurately spot outliers. There were no other missing responses in the dataset.

There were no specific patterns identified when reviewing the questions that participants did not answer. It is possible that participants may have misunderstood the questions being asked, or they did not notice that they skipped a question. Nevertheless, the IRB mandates that researchers cannot make survey questions required. Therefore, participants could simply choose to answer a question. The last process was to remove any existing outliers in order to meet the regression assumptions. More details on how outliers were identified and removed was discussed in the Assumptions section.

An overview of the missing data points in each stage and frequency counts and percentages are provided in Table 1 (Stage 1 $N = 51$ before data removal and Stage 2 $N = 50$ before data removal). From Stage 1, two data points were removed due to the requirements previously mentioned in the Missing and Excluded Data section and two due to outliers, which

would bring the total sample size for Stage 1 to 47 participants. From Stage 2, three data points were removed due to the requirements previously mentioned in the Missing and Excluded Data section and one from an outlier, which brought the total sample size for Stage 2 to 46 participants.

Table 1.

Summary of Missing and Excluded Data

Variable		Stage 1	Stage 2
Personality	Openness	2 (4.26%)	0 (0%)
	Agreeableness	1 (2.13%)	2 (4.35%)
Total		3 (6.39%)[a]	2 (4.35)[a]

Note. The total is not the sum of all missing data because some cases had multiple missing data points. This table also does not include the removal of outliers

Descriptive Statistics for Stage 1

In Stage 1, participants (N = 47) included 30 males and 17 females. The mean age of the sample was 36.31 (SD = 8.37). A breakdown of the descriptive statistics for Stage 1 is illustrated in Table 2.

Table 2

Summary of Stage 1 Descriptive Statistics

	Variable	*N*	*M*	*SD*
Gender	Age	47	36.31	8.37
	Male	30 (63.8%)		
	Female	17 (36.2%)		
Physician Specialty	Cardiothoracic	12 (25.5%		
	Cardiothoracic; Critical Care	4 (8.5%)		
	Critical Care	6 (12.8%)		
	No Specialty	12 (25.5%)		
	Obstetric	2 (4.3%)		
	Pain	1 (2.1%)		
	Pain; Regional	1 (2.1%)		
	Pediatrics	6 (12.8%)		
Ethnicity	Asian	15 (31.9%)		
	Caucasian	28 (59.6%)		
	Hispanic	1 (2.1%)		
	African	1 (2.1%)		
	Other	1 (2.1%)		

Descriptive Statistics for Stage 2

In Stage 2, participants (N = 46) included 31 males and 15 females. The mean age of the sample was 47.53 (SD = 12.90). A breakdown of the descriptive statistics for Stage 2 is illustrated in Table 3.

Table 3

Summary of Stage 2 Descriptive Statistics

	Variable	*N*	*M*	*SD*
	Age	46	47.53	12.90
Gender	Male	31 (67.3%)		
	Female	15 (32.6%)		
Physician Specialty	Cardiothoracic	13 (25%)		
	Cardiothoracic; Critical Care	4 (8.5%)		
	Critical Care	6 (13%)		
	No Specialty	15 (32.6%)		
	Obstetric	3 (6.5%)		
	Pain	2 (4.3%)		
	Pain; Regional	0 (0%)		
	Pediatrics	3 (6.5%)		
Ethnicity	Asian	2 (3.8%)		
	Caucasian	41 (78.8%)		
	Hispanic	3 (6.5%)		
	African	0 (0%)		
	Other	0 (0%)		

Inferential Statistics

Sample Sizes, Effect Size and Observed Power

A power analysis was conducted a priori using the program G*Power 3.1.9.7 to compute the analysis. Entering a total of 16 predictors, a large effect size of 0.35, an alpha level of 0.05, and a power (beta) of .80 into G*Power determined each stage would need 70 participants. As stated in earlier sections, this research study incorporates two stages: developing the regression

equation and then testing the model to ensure validity. Each stage required a minimum of 70 participants.

Because we were unable to recruit the minimum number of participants required for our initial model, a new power analysis was conducted. Entering a total of 93 participants, a large effect size of 0.35, an alpha level of 0.05, and a power of .80, G*Power determined only six predictors could be evaluated in this study, which were chosen a priori. Therefore, stage 1 had 47 participants used to build the regression equation, and stage 2 had 46 participants to test the model developed in the first stage.

Assumptions of Regression

In order to provide valid results, the design must not violate the eight assumptions for multiple linear regression. The eight assumptions are as follows:

1. Assumption #1: The dependent variable must be continuous.
2. Assumption #2: There must be more than two independent variables.
3. Assumption #3: The study should have independent observations.
4. Assumption #4: A linear relationship must be present between the dependent variable and each of the independent variables.
5. Assumption #5: The data should show homoscedasticity.
6. Assumption #6: The data should not show multicollinearity.
7. Assumption #7: There are no significant outliers in the study.
8. Assumption #8: Verify that the residual errors are normally distributed.

Scenario 1

Assumption 1 was not violated because the dependent variable was treated as an interval scale of measurement. The dependent variable consisted of a six-item Likert-type scale that

averaged participants' scores for a total willingness to proceed with an anesthetic score. The second assumption stated that there should be more than two independent variables. Assumption 2 was not violated since there were six predictors. Assumption 3 examined independent observations where the Durbin-Watson statistic was 1.533, which was in the recommended range of 1.5 - 2.5 (Fields, 2009).

Furthermore, assumption 4 stated that there must be a linear relationship between the dependent and independent variables. Assumption 4 was violated because the partial regression plots did not show a linear relationship. For scenario 1, the variables included in the final regression model were imposter syndrome and risk-taking. See figures 1 and 2 for the partial regression plots for scenario 1.

Figure 1

Partial Regression Plot for Imposter Syndrome

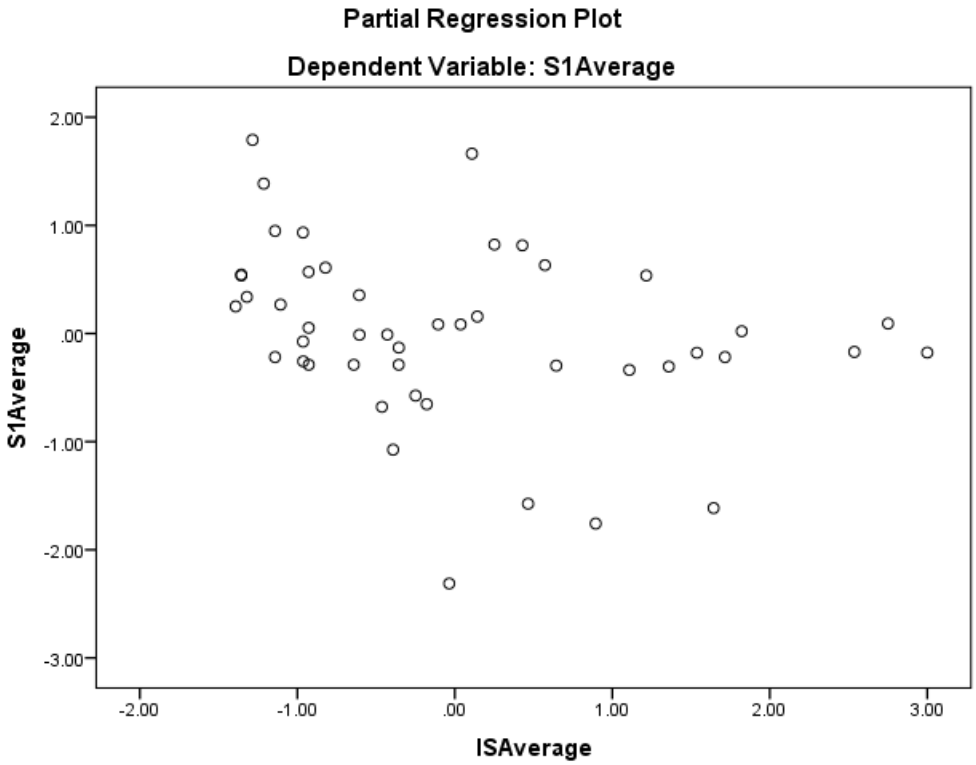
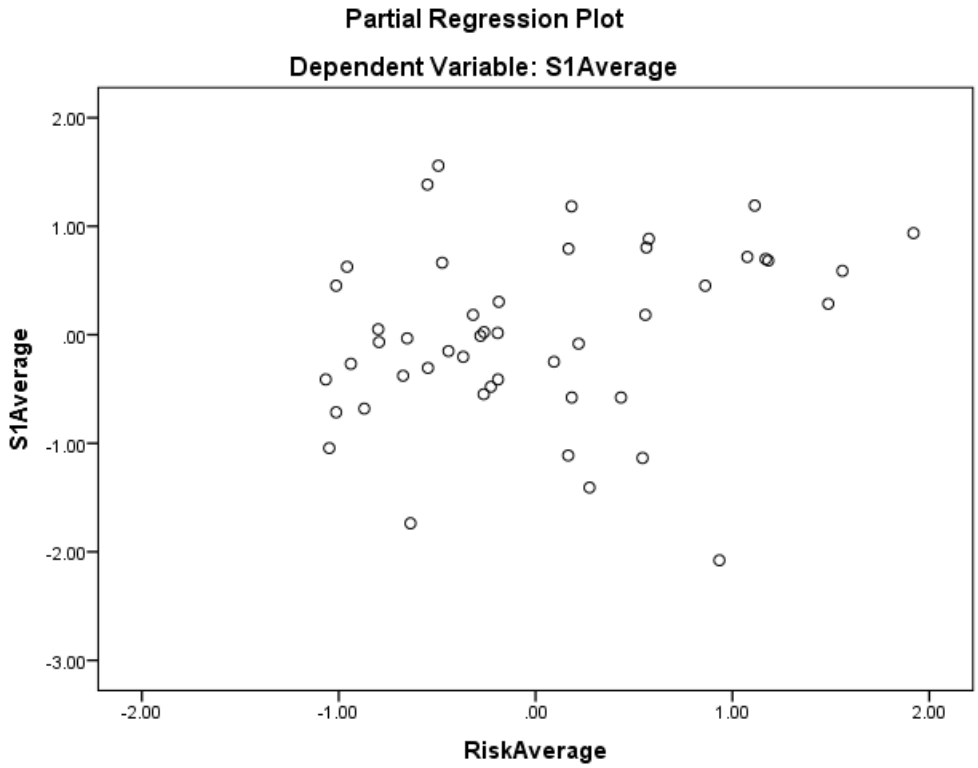


Figure 2

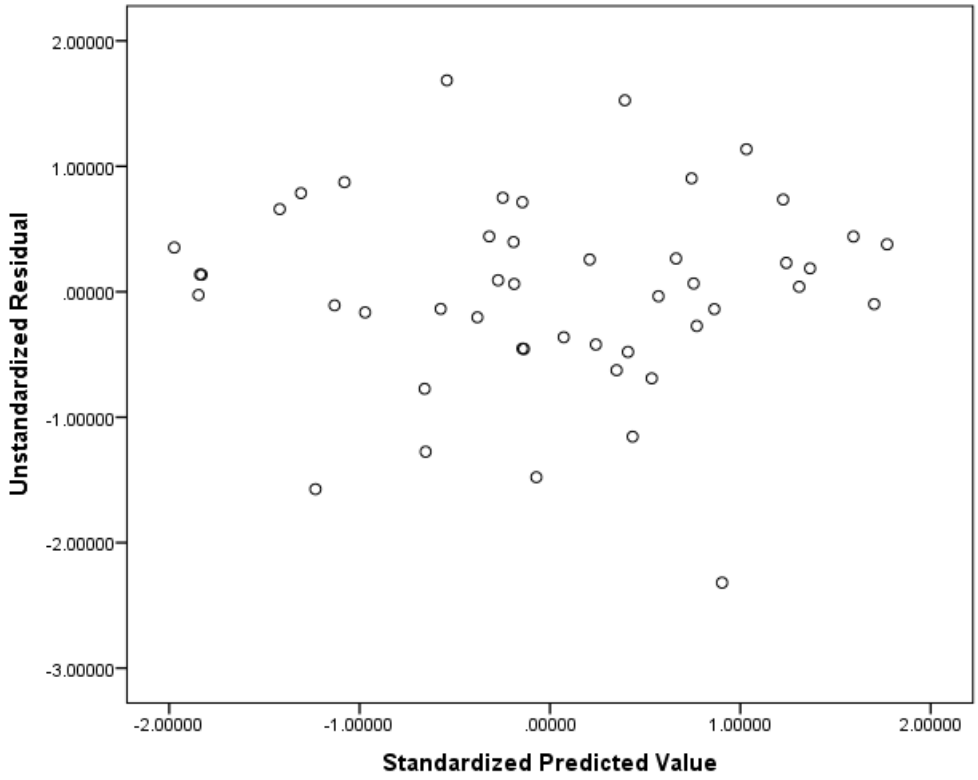
Partial regression plot for Risk-Taking



The fifth assumption stated that the data should show homoscedasticity. This assumption examines the variances across all the independent variables to confirm that they are constant. The standardized residuals and the predicted values displayed in a scatterplot can be used to determine if assumption 5 was met. After a visual inspection, it was determined that assumption 5 was not violated (see Figure 3) since the data points were randomly placed within the scatterplot, and there were no patterns.

Figure 3

Scatterplot for Homoscedasticity



Assumption 6 stated that the data should not show multicollinearity. Multicollinearity occurs when the dependent variable and the independent variable are highly correlated. The Tolerance/VIF values were used to assess multicollinearity in the data (Tolerance should not be less than 0.1, and VIF should not exceed 10). None of the variables violated this assumption (see Table 4 for Tolerance/VIF values for scenario 1).

Table 4

Summary of Collinearity Statistics

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Adverse Events	.984	1.016
Medical Errors	.913	1.095
Openness	.867	1.153
Agreeableness	.973	1.028
Imposter Syndrome	.839	1.191
Risk-Taking	.898	1.114

The seventh assumption states that there should be no outliers in the data. Outliers are data points that are significantly different from all the other data points within a data set and can contribute to inaccurate results. The outliers for this study were detected using Mahalanobis Distance to show significant outliers. There were two outliers identified in stage 1 and only one identified in stage 2. Thus, there was a total of 93 participants.

Lastly, the final assumption stated that the residual errors should be normally distributed. Both a histogram and a normal probability plot (P- Plot) can be used to identify if the residual errors are normally distributed. While the histogram showed that the residual errors are not perfectly normal (see Figure 4), they are distributed enough not to violate this assumption. In addition, a P-Plot can be used to identify if this assumption was met as it illustrates a diagonal line with residual errors running along the line (see Figure 5). Although the errors do stray from the line slightly, they do not deviate enough to violate this assumption.

Figure 4

Histogram Showing the Distribution of Residual Errors

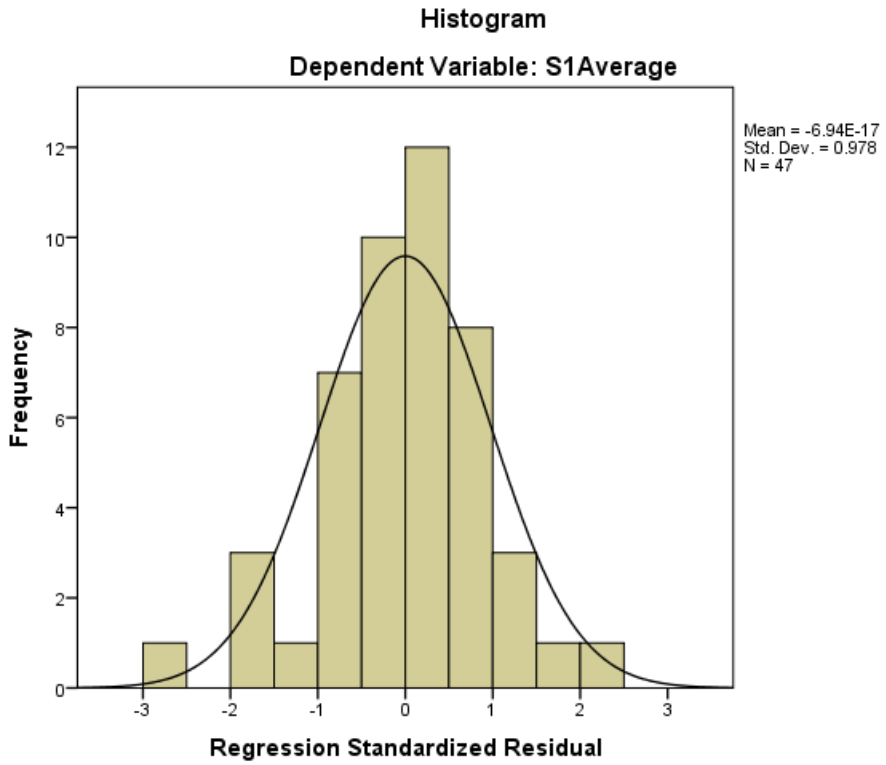
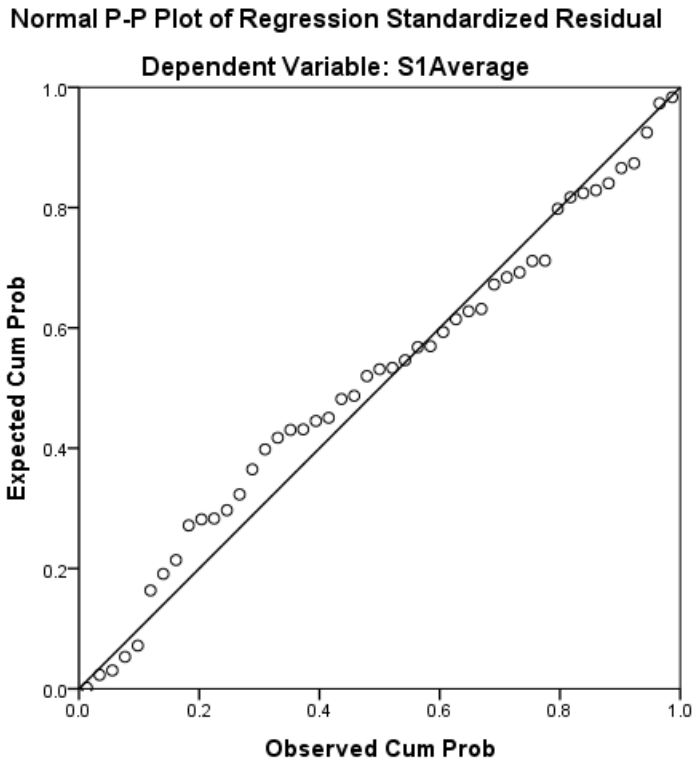


Figure 5

Normal Probability Plot



Scenario 2

Similar to scenario 1, assumption 1 within the second scenario was not violated because the dependent variable was treated as an interval scale of measurement. The dependent variable consisted of a six-item Likert-type scale that averaged participants' scores for a total willingness to proceed with an anesthetic score. The second assumption states that there should be more than two independent variables. Assumption 2 was not violated since there were six predictors. Assumption 3 examined independent observations where the Durbin-Watson statistic was 1.874, which was in the recommended range of 1.5 - 2.5 (Fields, 2009).

Next, assumption 4 stated that there must be a linear relationship between the dependent and independent variables. Assumption 4 was violated because the partial regression plots did

not show a linear relationship. For scenario 2, the variables included in the final regression model was openness and agreeableness. See figures 6 and 7 for the partial regression plots for scenario 2.

Figure 6

Partial Regression Plot for Openness

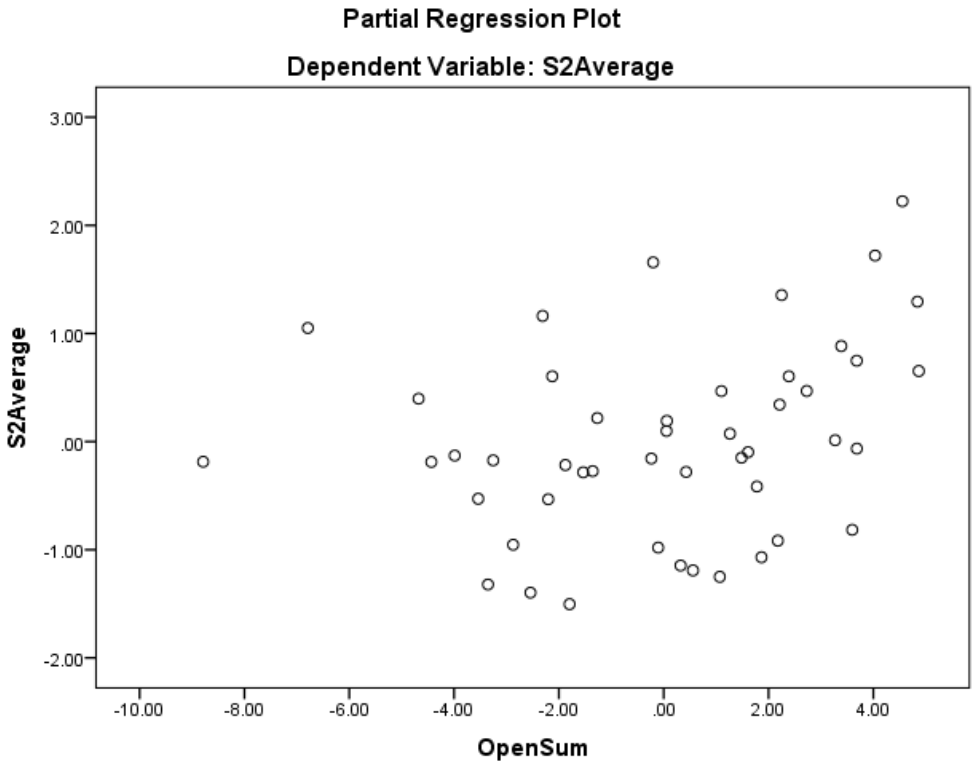
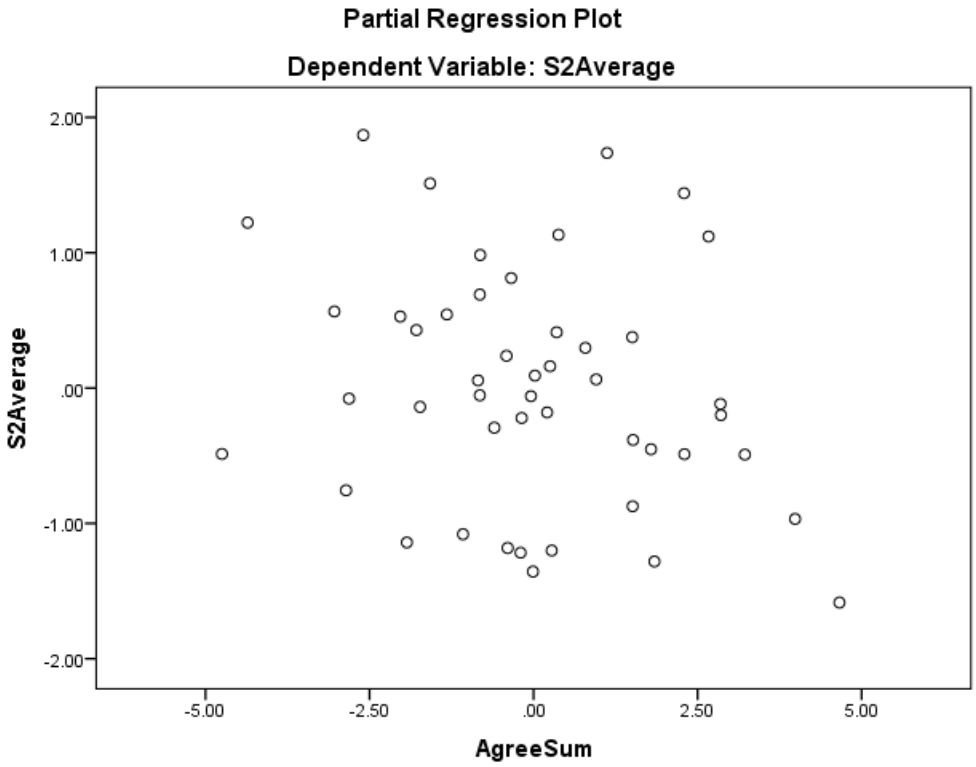


Figure 7

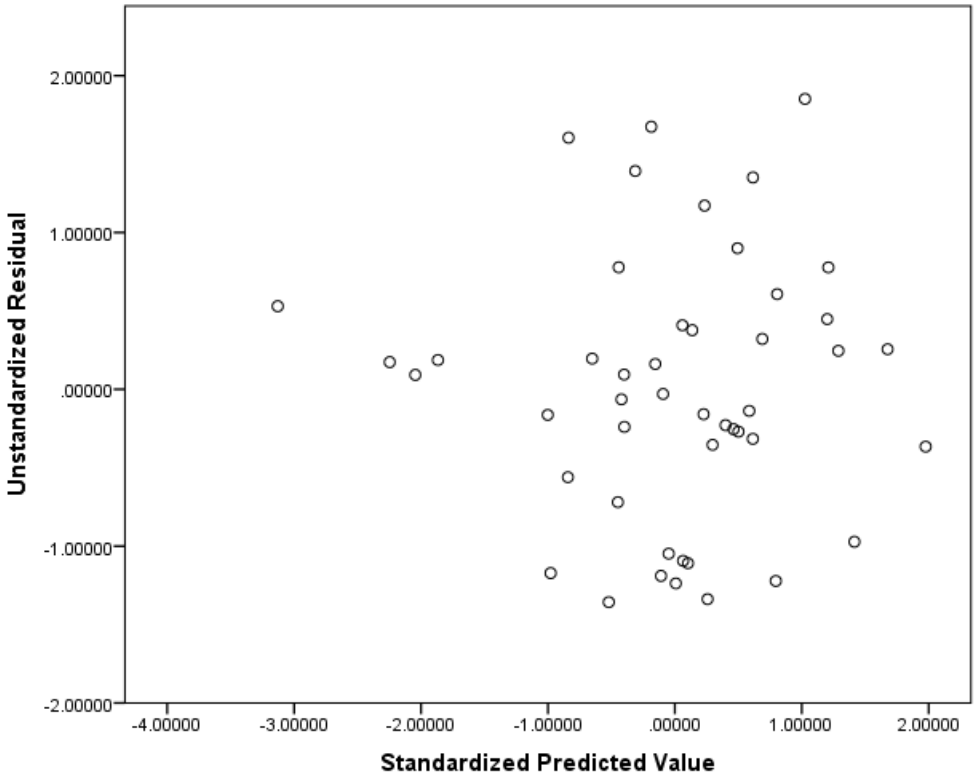
Partial Regression Plot for Agreeableness



Assumption 5 stated that the data should show homoscedasticity. After a visual inspection, it was determined that assumption 5 was not violated (see Figure 8) since the data points are randomly placed within the scatterplot, and there were no patterns.

Figure 8

Scatterplot for Homoscedasticity



The sixth assumption states that the data should not show multicollinearity. The Tolerance/VIF values were used to assess multicollinearity in the data (Tolerance should not be less than 0.1, and VIF should not exceed 10). None of the variables violated this assumption and were the same as scenario 1.

Assumption 7 states that there should be no outliers in the data. The outliers for this study were detected using Mahalanobis Distance to show significant outliers. As previously stated, there were two outliers identified in stage 1 and only one identified in stage 2 – totaling 93 participants.

The final assumption states that the residual errors should be normally distributed. Both a histogram and a normal probability plot (P- Plot) can be used to identify if the residual errors are

normally distributed. The histogram did not show that the data were normally distributed. Furthermore, the P-Plot also did not show a normal distribution; therefore, this assumption was not met for scenario 2.

Figure 9

Histogram Showing the Distribution of Residual Errors

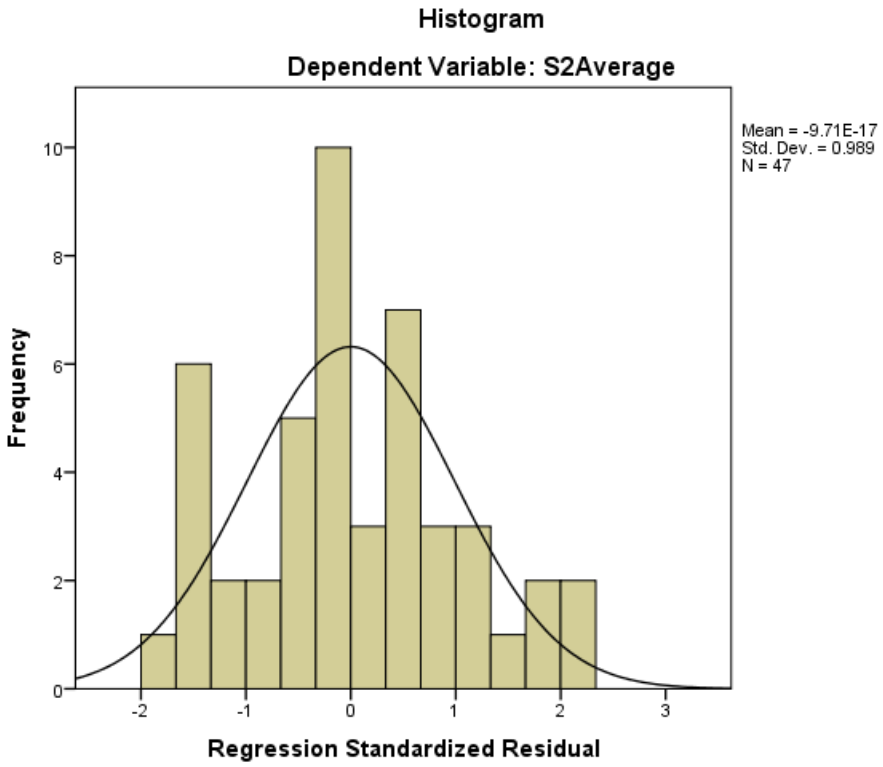
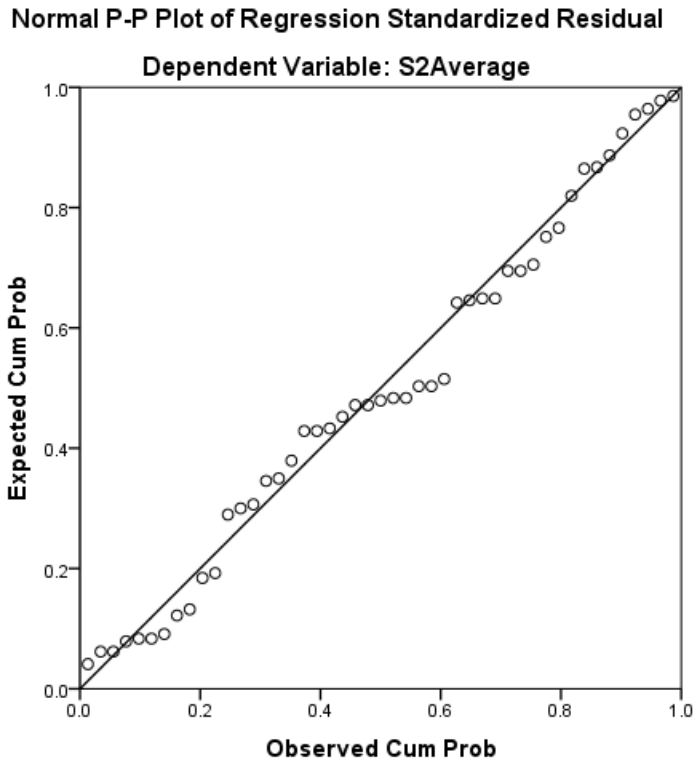


Figure 10

Normal Probability Plot, S2Average



Scenario 3

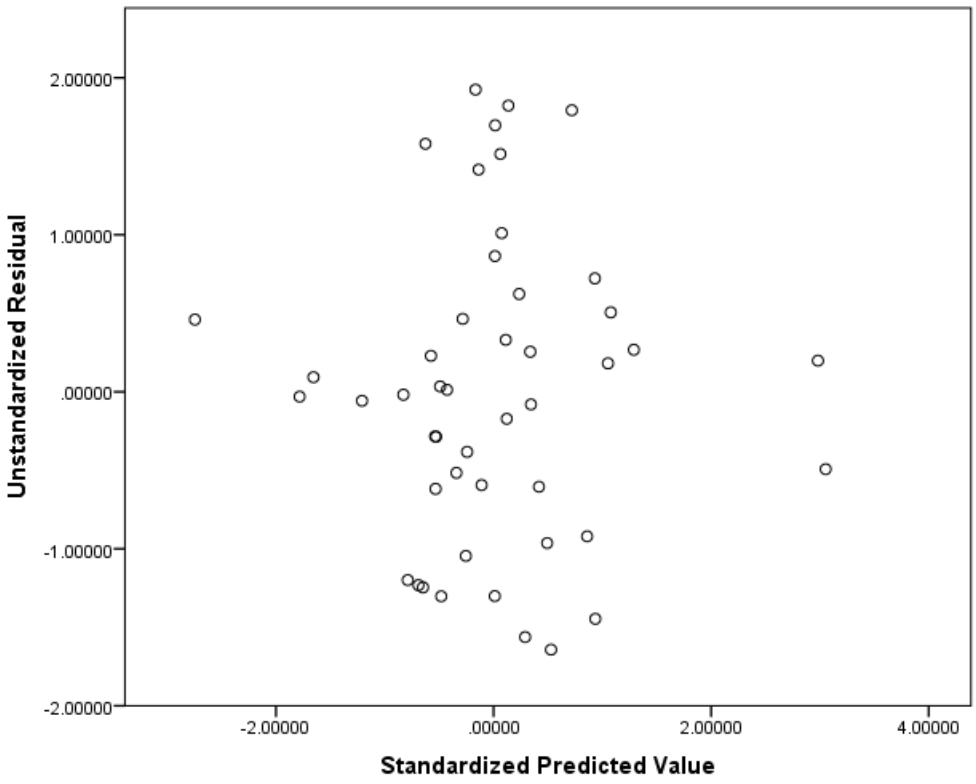
Assumption 1 in every scenario was not violated because the dependent variable was treated as an interval scale of measurement. The second assumption stated that there should be more than two independent variables. Assumption 2 was not violated since there were six predictors. Assumption 3 examined independent observations where the Durbin-Watson statistic was 1.945, which was in the recommended range of 1.5 - 2.5 (Fields, 2009).

The fourth assumption stated that there must be a linear relationship between the dependent variable and the independent variable. For scenario 3, there were no significant predictors in the final model; therefore, partial regression plots were not included. Assumption 5

stated that the data should show homoscedasticity. After a visual inspection, it was determined that assumption 5 was violated (see Figure 11) since the data points were not randomly placed within the scatterplot and there appears to be a pattern.

Figure 11

Scatterplot for Homoscedasticity, Scenario 3



The sixth assumption states that the data should not show multicollinearity. The Tolerance/VIF values were used to assess multicollinearity in the data (Tolerance should not be less than 0.1, and VIF should not exceed 10). None of the variables violated this assumption and were the same as scenario 1 and scenario 2. Assumption 7 stated that there should be no outliers in the data. The outliers for this study were detected using Mahalanobis Distance to show significant outliers. As previously stated, there were two outliers identified in stage 1 and only one identified in stage 2.

The final assumption states that the residual errors should be normally distributed. Both a histogram and a normal probability plot (P- Plot) can be used to identify if the residual errors are normally distributed. The histogram did not show that the data was normally distributed. Furthermore, the P-Plot also did not show a normal distribution; therefore, this assumption was not met for scenario 3.

Figure 12

Histogram Showing the Distribution of Residual Errors, S#Average

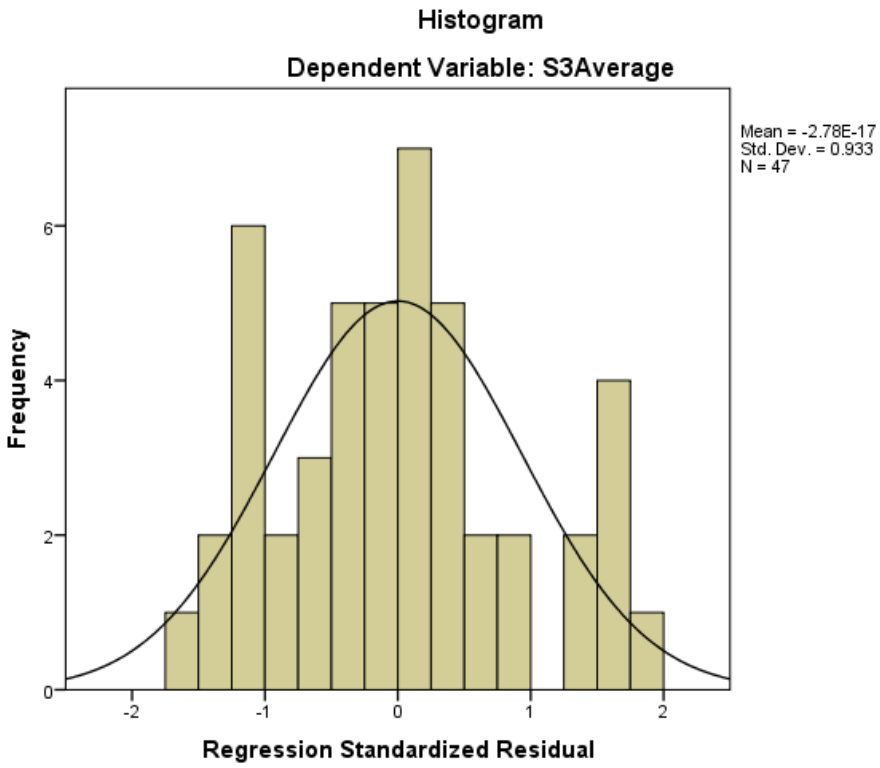
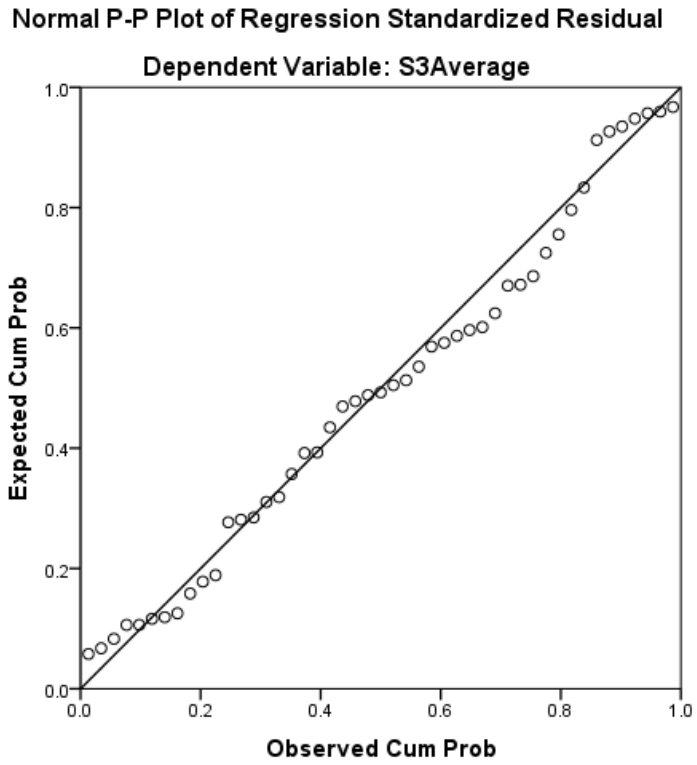


Figure 13

Normal Probability Plot, S3Average



Scenario 4

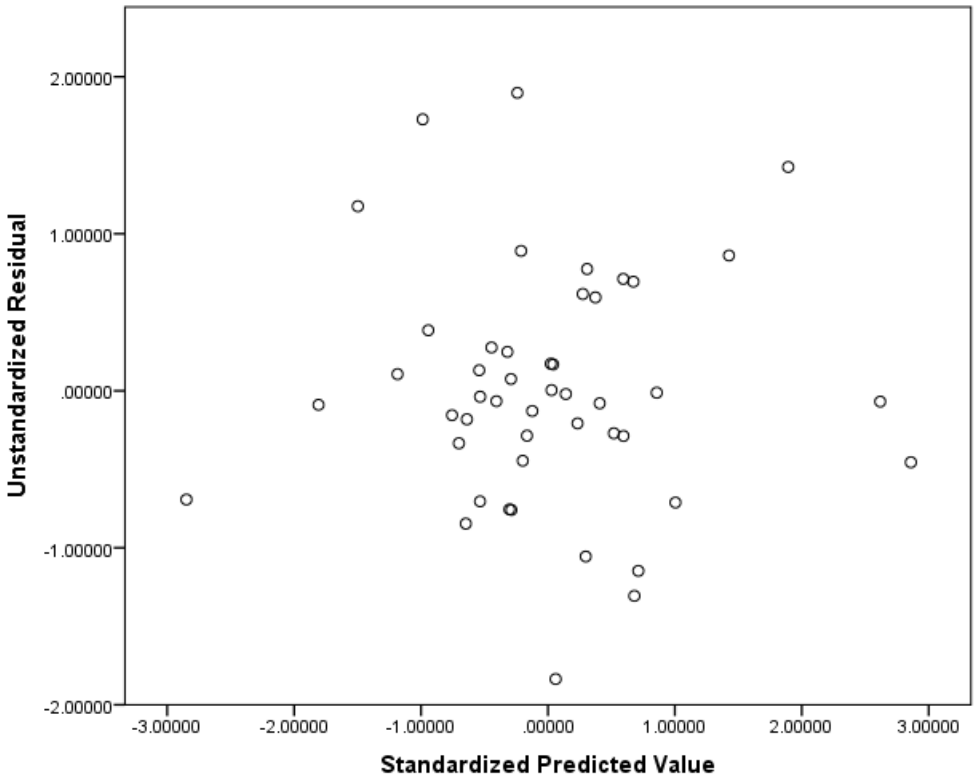
Finally, assumption 1 in every scenario was not violated because the dependent variable was treated as an interval scale of measurement. The second assumption stated that there should be more than two independent variables. Assumption 2 was not violated since there were six predictors. Assumption 3 examined independent observations where the Durbin-Watson statistic was 1.945, which was in the recommended range of 1.5 - 2.5 (Fields, 2009).

The fourth assumption stated that there must be a linear relationship between the dependent and independent variables. For scenario 3, there were no significant predictors in the final model; therefore, partial regression plots were not included. Assumption 5 stated that the data should show homoscedasticity. After a visual inspection, it was determined that assumption

5 was not violated (see Figure 14) since the data points are randomly placed within the scatterplot, and there is no pattern.

Figure 14

Scatterplot for Homoscedasticity



The sixth assumption stated that the data should not show multicollinearity. The Tolerance/VIF values were used to assess multicollinearity in the data (Tolerance should not be less than 0.1, and VIF should not exceed 10). None of the variables violated this assumption and were the same as the first three scenarios. Assumption 7 stated that there should be no outliers in the data. The outliers for this study were detected using Mahalanobis Distance to show significant outliers. As previously stated, there were two outliers identified in stage 1 and only one identified in stage 2.

The final assumption stated that the residual errors should be normally distributed. Both a histogram and a normal probability plot (P- Plot) can be used to identify if the residual errors are normally distributed. The histogram (Figure 15) did not show that the data were normally distributed. Furthermore, the P-Plot also did not show a normal distribution; therefore, this assumption was not met for scenario 3.

Figure 15

Histogram Showing the Distribution of Residual Errors

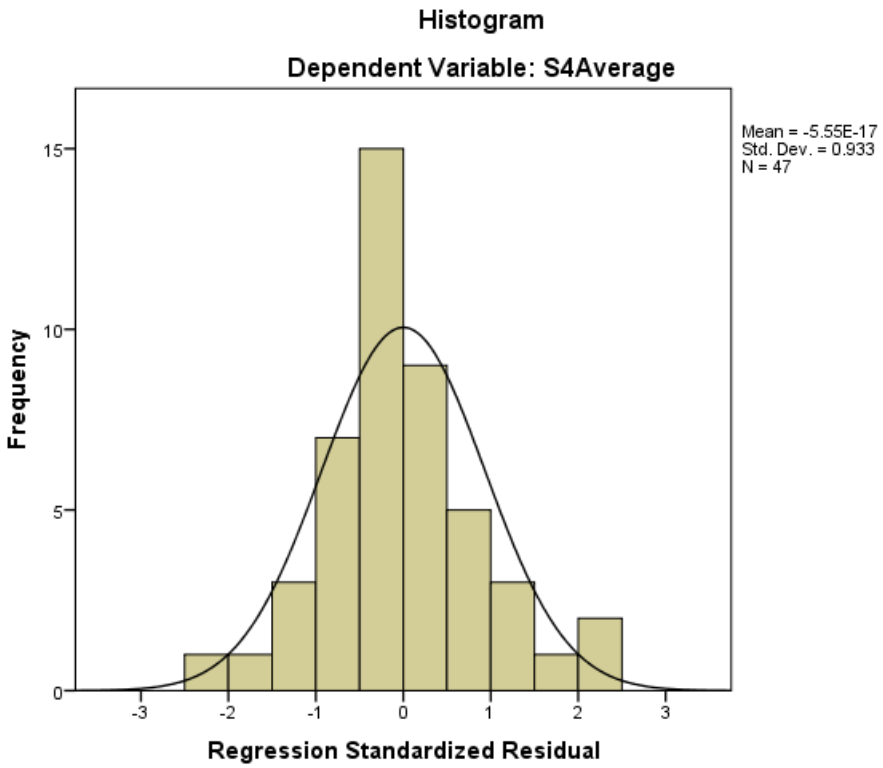
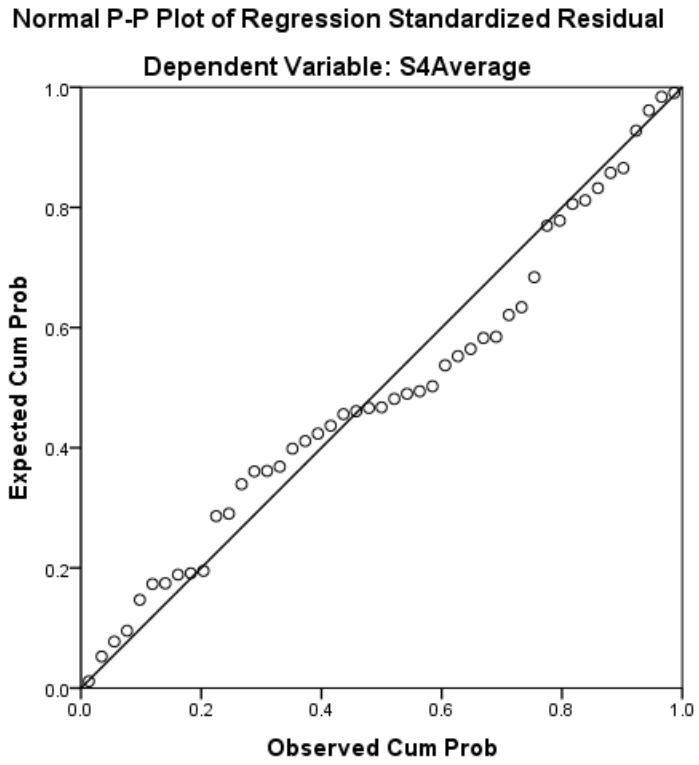


Figure 16

Normal Probability Plot, S4Average



Stage One

In the first stage of this study, we developed a regression equation that was used to predict anesthesiologist's willingness to proceed with an anesthetic. Six predictors were examined: the number of adverse events experienced by physicians, a recent history of errors, openness, agreeableness, imposter syndrome, and risk-taking. The study used a backward stepwise regression which helped to determine which variables significantly predicted an anesthesiologist's willingness to proceed with an anesthetic. The benefit of using a backwards stepwise regression technique is the process removes the predictors that are not significant first until the model only represents the predictors that are statistically significant. Anesthesiologists' willingness to proceed with an anesthetic was measured across four different scenarios and is detailed below.

Scenario 1

For scenario 1, imposter syndrome and risk-taking were significant predictors that were included in the final model. The regression equation is as follows:

$$Y = .762 - .206X_1 + .258X_2$$

Y represented the dependent variable, which is an anesthesiologist's willingness to proceed with an anesthetic. X_1 represents imposter syndrome, and X_2 represents risk-taking. The results for scenario 1 showed an $R^2 = .191$ and an adjusted $R^2 = .135$, thus accounting for 19% of the variance for an anesthesiologist's willingness to proceed with an anesthetic. Overall, the model was statistically significant, $F(2,46) = 4.499$, $p = .017$. The model summary can be found in Appendix G, and an ANOVA summary table can also be found in appendix H.

There were two significant predictors in the first scenario, and the coefficients are located in Table 5. The unstandardized B coefficients showed that when holding all the variables constant for every unit increase in risk-taking, an anesthesiologist's willingness to proceed with an anesthetic increased .206 units on average. The coefficient was significant, $t(46) = -2.076$, $p = .044$ (see Table 5). Similarly, when holding all the variables constant for every unit increase in imposter syndrome, an anesthesiologist's willingness to proceed with an anesthetic increased .258 units on average. The coefficient was not significant, $t(46) = -1.732$, $p = .090$.

Table 5

Regression Coefficients for Scenario 1

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. error	Beta			Zero-order	Partial	Part
(Constant)	.762	.184		4.145	.000			
Imposter Syndrome	-.206	.099	-.290	-2.076	.044	-.336	-.299	-.285
Risk-Taking	.258	.149	.242	1.732	.090	.297	.253	.238

Note. Dependent Variable: Anesthesiologists' willingness to proceed with an anesthetic

Scenario 2

For scenario 2, agreeableness and openness were significant predictors that were included in the final model. The regression equation is as follows:

$$Y = .720 + 0.78X_1 - .137X_2$$

Y represented the dependent variable which is an anesthesiologist's willingness to proceed with an anesthetic. X_1 represents openness, and X_2 represents agreeableness. The results for scenario 2 showed an $R^2 = .213$ and an adjusted $R^2 = .171$, thus accounting for 21% of the variance for an anesthesiologist's willingness to proceed with an anesthetic. Overall, the model was statistically significant, $F(2,37) = 5.012$, $p = .012$. The model summary can be found in Appendix I, and an ANOVA summary table can also be found in Appendix J.

There were two significant predictors in the scenario 2, and the coefficients are located in Table 6. The unstandardized B coefficients showed that when holding all the variables constant for every unit increase in openness, an anesthesiologist's willingness to proceed with an anesthetic increased .078 units on average. The coefficient was significant, $t(39) = 2.035$, $p = .049$ (see Table 6). Also, when holding all the variables constant for every unit increase in

imposter syndrome, an anesthesiologist's willingness to proceed with an anesthetic decreased .137 units on average. The coefficient was significant, $t(39) = -2.230$, $p = .032$.

Table 6

Regression Coefficients for Scenario 2

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. error	Beta			Zero-order	Partial	Part
(Constant)	.720	1.176		.612	.544			
Openness	.078	.038	.298	2.035	.049	.328	.317	.297
Agreeableness	-.137	.061	-.327	-2.230	.032	-.354	-.344	-.325

Note. Dependent Variable: Anesthesiologist's willingness to proceed with an anesthetic

Scenario 3

For scenario 3, there were no significant predictors that were included in the final model. Overall, the model was not statistically significant, $F(1,39) = 1.512$, $p = .226$. The model summary and ANOVA summary table can be found in Appendix K and L. Possible explanations for this outcome are deliberated in the Discussion section.

Scenario 4

Lastly, there were no significant predictors that were included in the final model for scenario 4. In general, the model was not statistically significant, $F(1,39) = 2.704$, $p = .226$. The model summary can be found in Appendix M, and an ANOVA summary table can also be found in Appendix N. Similarly, the potential causes of this outcome are discussed in the Discussion section.

Stage Two

A new sample was collected for stage two in order to conduct model fit testing. Model fit tests the validity of the prediction equation that was created in the first stage to ensure that both samples are from the same population. In other words, the regression equation that was created in the first stage was used to predict the participants' scores on the Willingness to Proceed with an Anesthetic Scale in the second stage. Finally, the predicted scores will then be compared to the participants' actual scores in the second stage. This process was accomplished through a *t*-test, a correlation analysis, and cross-validated R^2 scores between the scores in both stages.

Scenario 1

First, a *t*-test was conducted to compare the predicted scores and the actual scores on the Willingness to Proceed with an Anesthetic Scale. The results indicated no significant difference between the scores $t(96) = -1.007$, $p = .318$. The results of the *t*-test are illustrated in Table 7.

Table 7

T-Test between Actual and Predicted Scores for Scenario 1

Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval	
F	Sig.	t	df	Sig.	Mean Difference	Std. Error Difference	Lower	Upper
46.779	.000	-1.007	96	.318	-.14163	.14066	-.42085	.13758

Next, a correlation analysis was conducted to confirm that the predicted scores and the actual scores showed a linear relationship. The results suggested that there was a linear relationship $r(49) = .509$, $p < .001$ between the scores. The results of the correlation analysis are illustrated in Table 8.

Table 8

Correlational Analysis between Actual and Predicted Scores for Scenario 1

		Actual	Predicted
Actual	Pearson	1	.509
	Sig.		.000
	N	49	49
Predicted	Pearson	.509	1
	Sig.	.000	
	N	49	49

Finally, cross-validated R^2 were compared between participant's predicted scores and the actual scores. The following formula calculates the estimated square cross-validity coefficient:

$$R_{cv}^2 = 1 - \left(\frac{N-1}{N}\right)\left(\frac{N+k+1}{N-k-1}\right)(1-R^2)$$

where N = sample size, k = number of predictors and R^2 = observed squared multiple correlation (Pedhazur, 1997). Using the formula listed above, the stage 2 cross-validity coefficient is calculated below:

$$.125 = 1 - \left(\frac{49-1}{49}\right)\left(\frac{49+6+1}{49-6-1}\right)(1-.191)$$

For stage 2 scenario 1, N = 49, k = 6, and R^2 = .507. The cross-validity coefficient is .125, which indicates poor to moderate model fit because the cross-validity coefficient is not similar to the R^2 found in the original model produced during Stage 1 which was .191.

Scenario 2

Another t-*t*est was conducted to compare the predicted scores and the actual scores on the Willingness to Proceed with an Anesthetic Scale for scenario 2. The results indicated that there

was no significant difference between the scores $t(96) = -.864$, $p = .322$ .The results of the *t*-test are illustrated in Table 9.

Table 9

T-Test between Actual and Predicted Scores for Scenario 2

Levene's Test for Equality of Variances		t-test for Equality of Means						
							95% Confidence Interval	
F	Sig.	t	df	Sig.	Mean Difference	Std. Error Difference	Lower	Upper
92.631	.000	-.864	96	.322	-.15327	.17737	-.50534	.19881

Following the analysis of the *t*-test for scenario 2, a correlation analysis was conducted to ensure that the predicted scores and the actual scores showed a linear relationship. The results indicated that there was a linear relationship $r(49) = .518$, $p > .001$ between the scores. The results of the correlation analysis are illustrated in Table 10.

Table 10

Correlational Analysis between Actual and Predicted Scores for Scenario 2

		Actual	Predicted
Actual	Pearson	1	.518
	Sig.		.000
	N	49	49
Predicted	Pearson	.518	1
	Sig.	.000	
	N	49	49

Lastly, cross-validated R^2 scores were compared between participants' predicted scores and the actual scores. Similarly, the following formula calculates the estimated square cross-validity coefficient:

$$R_{cv}^2 = 1 - \left(\frac{N-1}{N}\right)\left(\frac{N+k+1}{N-k-1}\right)(1-R^2)$$

where N = sample size, k = number of predictors and R^2 = observed squared multiple correlation (Pedhazur, 1997). Using the above formula, the stage 2 cross-validity coefficient is calculated below:

$$.263 = 1 - \left(\frac{49-1}{49}\right)\left(\frac{49+6+1}{49-6-1}\right)(1-.213)$$

For stage 2 scenario 2, N = 49, k = 6, and R^2 = .263. The cross-validity coefficient is .263, which indicates a moderate model fit because the cross-validity coefficient is somewhat similar to the R^2 found in the original model produced during Stage 2 which was .213.

Summary

Chapter 4 provided an in-depth description of the regression and model fit analysis results conducted for this study. The purpose of this research was to explore what factors predict an anesthesiologist's willingness to proceed with an anesthetic. This was completed in two stages. The first stage consisted of the development of a regression equation that was used to predict anesthesiologists' willingness to proceed with an anesthetic. The second stage consisted of model fit testing with an additional data collection process that was used to test the model developed in the first stage. Testing the model was accomplished through conducting a *t*-test, a correlation analysis, and cross-validated R^2.

Stage 1 involved four scenarios that were used to test anesthesiologists' willingness to proceed with an anesthetic. Six predictors were examined in each scenario: the number of adverse events experienced by physicians, a recent history of errors, openness, agreeableness, imposter syndrome, and risk-taking. In the first scenario, imposter syndrome and risk-taking

were the two significant predictors that accounted for 19% of the variance. The model fit testing indicated a strong model fit.

In the second scenario, there were two significant predictors: openness and agreeableness, and these predictors accounted for 21% of the variance. The results for the model fit indicated a strong model fit. Scenarios 3 and 4 did not have any significant predictors. An explanation on the possible reasons for these outcomes was deliberated in the Discussion section as well as a detailed overview of the interpretation of the results.

Chapter 5

Discussion

Introduction

The purpose of this study was to explore the factors that predict an anesthesiologist's willingness to proceed with an anesthetic. The study consisted of two stages: The first stage consisted of developing a regression equation that was used to predict anesthesiologists' willingness to proceed with an anesthetic. During the second stage, an additional dataset was collected to test the model developed in the first stage. The research study used a survey-based correlational design with multiple linear regression as the statistical procedure for data analyses.

Participants were recruited from the University of Chicago's Department of Anesthesia and Critical Care within the Biological Sciences Division and the University of Florida's Department of Anesthesiology. The factors investigated included the number of adverse events experienced by physicians, a recent history of errors, openness, agreeableness, imposter syndrome, and risk-taking. The dependent variable was an anesthesiologist's willingness to proceed with an anesthetic.

Chapter 5 will elaborate on the results from Chapter 4 and discuss the future implications for this study. This includes a discussion regarding the hypotheses and whether or not the data supported each hypothesis. This section will also provide the practical applications for this study and the limitations and ideas for future research. To begin, the revised research hypotheses were as follows:

Hypothesis 1

H_{A1}: At least one demographic variable (age, gender, or ethnicity) will significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 2

H_{A2}: The physician subspecialty does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 3

H_{A3}: The number of adverse events does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 4

H_{A4}: Recent history of errors does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 5

H_{A5}: The Big Five personality traits (openness, conscientiousness, extraversion, agreeableness and neuroticism) do significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 6

H_{A6}: Imposter syndrome does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 7

H_{A7}: Perceived organizational support does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Hypothesis 8

H_{A8}: Risk-taking behavior does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables.

Summary of Findings

This study focused on the factors that could potentially influence an anesthesiologist's willingness to proceed with an anesthetic. To investigate, a predictive regression equation was developed and tested in two stages. The first stage was the development of a regression equation, and the second stage tested the equation developed in the first stage. Anesthesiologists' willingness was tested throughout four different scenarios.

In scenario 1, the significant predictors were imposter syndrome and risk-taking, which accounted for 19% of the variance. During the second stage, model fit was used to test the regression equation developed in stage 1. Model fit essentially tests participants' predicted scores to their actual scores using a *t*-test, correlation and cross-validated R^2. The *t*-test was not significant, $t(96) = -1.007$, $p = .318$. Next, the correlation analysis results showed no linear relationship $r(49) = .051$, $p = .729$ between the scores. Finally, the cross-validated R^2 was .125, which was not similar to the R^2 in stage 1 (.191). When taken together, the results of the three analyses indicated a strong model fit.

In scenario 2, openness and agreeableness were significant predictors, which accounted for 21% of the variance. During the second stage, the *t*-test was not significant, $t(96) = -.864$, $p = .322$. The correlation analysis results showed a linear relationship $r(49) = .518$, $p > .001$ between the scores. The cross-validated R^2 was .263 and was similar to the R^2 in stage 1, which was .213. The results of the three analyses supported the validity of the model. Finally, in scenarios 3 and 4, no significant predictors were included in the final model.

General Discussion

As previously stated, the purpose of this study was to explore the factors that predict an anesthesiologist's willingness to proceed with an anesthetic. Since the minimum participant requirements were not met, only six predictors were examined. The decision to test these predictors was decided among anesthesiologists on the importance of the factors within the field. The predictors that were not tested included: age, gender, ethnicity, physician subspecialty, conscientiousness, extraversion, neuroticism, and perceived organizational support. Although these factors were not included in this study, prior research focusing on these variables have been shown to influence performance (Gneezy et al., 2003), willingness (Rice et al., 2019), risk aversion (Milner, Walters, et al., 2019), self-efficacy (Lahdenperä, 2018), decision-making (Woolf et al., 2015), and leadership opportunities (Capek et al., 1997). Future studies should concentrate on these predictors when testing for factors that influence anesthesiologists.

The hypotheses that were tested included the number of adverse events experienced by physicians, a recent history of errors, openness, agreeableness, imposter syndrome and risk-taking. This section describes the potential reasons for the results of the study and whether the hypotheses were supported or not. To begin, the third hypothesis stated that the number of adverse events does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables. The results of the study did not support this hypothesis. One possible reason could be a fear of reporting adverse events. Studies have shown that preventable adverse events are the third-leading cause of death, accounting for more than 250,000 fatalities a year (James, 2013; Johns Hopkins Medicine, 2016). One major impact to the healthcare community on patient safety came from the report *To Err Is Human: Building a Safer*

Health System. The authors highlighted the urgency for the community and public to acknowledge the rate of preventable medical errors within U.S hospitals (Kohn et al., 2000).

Another potential cause for this outcome is the absence of a national error reporting system. Classen et al. (2011) evaluated voluntary error reports by hospitals and found that nearly 90% of adverse events went unreported. Furthermore, a study investigating medical students' perceptions of safety found that only 51% of students would report medical incidents to the person in charge, and 21% said they noticed a change in behavior from superiors after discussing their concerns (Swamy et al., 2016). While hospitals around the U.S are working steadily to improve the quality of patient care and safety, additional research could focus on the relationship between the number of adverse events a physician experiences and willingness.

Similarly, hypothesis 4 stated that the physician's recent history of errors predicts an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables. The results of the study did not support this hypothesis. One probable reason for these results is that the participant did not want to disclose how many medical errors they have made in the last three months. Studies have investigated physician responses to their own medical errors and the errors of others (Rowe, 2004; Stangierski et al., 2012). The authors argue that the system does not properly prepare physicians for dealing with these errors, which can lead to adverse effects such as ignoring an error, blaming others, and desensitization. Manoj Jain, who is an infectious disease physician, explained that in medical school, the students were taught that errors were considered incidental lapses and were used as a teaching point. He argued that, as students, he and his colleagues were never taught how to disclose a medical error appropriately (Jain, 2013).

Furthermore, a recent study found that having a small focus group for students to learn about medical errors from faculty who shared their own personal experiences increased their understanding of the resources available to physicians following an adverse event (Musunur et al., 2020). Perhaps medical schools and hospitals alike should continue to create a culture in which doctors and nurses can disclose mistakes they have made to eventually work towards mitigating and hopefully preventing errors from happening again in the future. Overall, creating a standardized care plan for healthcare professionals who have recently experienced a medical error could potentially improve their well-being.

The fifth hypothesis stated that the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) do significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables. As mentioned, because the minimum participant requirements were not met, the analysis only included agreeableness and openness. The hypothesis was partially supported as agreeableness and openness were significant predictors in scenario 2.

A potential reason the hypothesis was partially supported may be that individuals who score high on agreeableness are said to be more altruistic in nature and are empathic, showing a high concern for the well-being of others (Furnham & Cheng, 2015). St. George's University medical student Moshe Karp explained that she wanted to go into medicine to help people. She also described her passion for tackling the challenges of working in emergency situations (St. George University, 2020). People generally want to be doctors because they want to help others, want to be a part of disease prevention, and improve the quality of life of others (Medical Universities of the Americas, n.d.). Other research has also shown that exposure to the medical field and longitudinal professional development are primary motivations for why individuals

apply to medical programs (Ballouz et al., 2021). It is also important to note that prior research has shown that high agreeableness qualities were also correlated with risk aversion (Lauriola & Weller, 2018).

The sixth hypothesis stated that imposter syndrome does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables. The data from scenario 1 supported this hypothesis. Clinical psychologists Pauline Clance and Suzanne Imes first used the term IS to describe the successful women who participated in individual psychotherapy with them (Clance & Imes, 1978). They explained that, regardless of their individual accomplishments, the women still felt as if they were "imposters." The authors described IS as the internal belief that you are not smart enough and have tricked everyone into believing you are (Clance & Imes, 1978).

LaDonna et al. (2018) explained that being a doctor is considered an elite career choice, and the perfectionist attitude most doctors maintain leads to a relationship between self-worth and achievement. In addition, Henning et al. (1998) conducted a study on the prevalence of IS in medical, dentistry, nursing, and pharmacy students and found that 30% of the students scored as imposters. A more recent study examined IS among 138 American students and found that a quarter of male medical students and almost half of the female medical students' experience IS (Villwock et al., 2016). This study also aligns with Qureshi et al. (2017), who conducted a similar investigation but targeted Pakistani medical students. The results suggested that 47.5% of the students experienced IS.

The research into understanding IS is progressing slowly in healthcare. While the literature on the impact of IS has been explained in general terms (Clance & Imes, 1978; Mullangi & Jagsi, 2019; Sonnak & Towell, 2001), more research is needed to understand all the

factors that contribute to IS in medical settings. As the awareness continues in medical practices, programs and educational resources can be created to help alleviate the psychological disbelief physicians feel, such as developing interventions and support groups.

Hypothesis 7 stated that perceived organizational support does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables. Our data did not support this hypothesis. One possible explanation of the data is physicians not wanting to disclose any negative criticism towards their employer. According to the U.S. Equal Employment Opportunity Commission (n.d.), nearly half of complaints are based on retaliation for the individual originally filing a complaint in the first place.

In addition, in a study on workplace culture, explained that approximately 53% of employees revealed that a hostile work environment deterred them from reporting the organization (Ali & Siddiqi, 2019). If physicians do not feel comfortable working within the culture of hospitals or doctor offices, it could influence how they treat and interact with patients and their families. Perhaps, future research should continue to investigate how perceived organizational support influences behavior.

Finally, hypothesis 8 stated that risk-taking does significantly predict an anesthesiologist's willingness to proceed with an anesthetic when controlling for all other variables. The data from scenario 1 support this hypothesis. Risk-taking has been described as making an action that could potentially have negative consequences (Beyth-Marom et al., 1993). The exploration into risk research has several perspective theories, such as cognitive (Palich & Bagby, 1995), emotional (Panno et al., 2013), and social (Willoughby et al., 2014) philosophies that help to explain the development of risk-taking in individuals. Risk behavior has also been evaluated in various fields just as finances (e.g., gambling), extreme sports (e.g., free solo

climbing, BASE jumping; Brymer, 2010), developmental psychology (Steinberg, 2008; e.g., risk-taking in adolescents), and healthcare (Arfanis et al., 2011).

The distinction of risk research in healthcare is the focus on how the medical staff's risk-taking philosophies may influence patients' health outcomes and fatalities. A recent study conducted by Pikkel et al. (2016) sought to determine whether doctors are risk-takers. The authors assessed physicians of all specialties, including surgeons, pediatricians, and anesthesiologists. While research has shown that physicians in general score low on risk-taking, the results of this study suggested that surgeons and anesthesiologists displayed greater risk-taking tendencies compared to other specialties. The authors highlight that one reason for this outcome could be because surgeons and anesthesiologists usually need to intervene more quickly than other specialties (Pikkel et al., 2016). In addition, these physician specialties tend to focus more on risk management since they are likely to encounter uncertainty more frequently (Bould et al., 2006; Rezaei et al., 2015).

Another study explored the effects of sleep deprivation among junior doctors working the night shift and found that risk-taking was more prevalent in doctors working the night shift than those who worked during the day (Capanna et al., 2017). The authors explain that the motivation behind conducting this study was the negative consequences of sleep deprivation, which has been shown to influence decision-making, information processing and clinical performance (Lockley et al., 2007; Weinger & Ancoli-Israel, 2002). While risk-taking is generally said to be low among physician populations, it is important to consider those who score high on scales that measure risks and their response during emergency situations.

Practical Applications

Before the Covid-19 pandemic, multiple studies revealed the poor working conditions for healthcare staff, including long work hours and personnel shortages (Ball et al., 2017; Glette et al., 2017). Doctors and nurses have explained that the daily exposure to patients' suffering is the primary reason for the adverse effects on their mental health (Tempski et al., 2012). A study that examined 212 resident physicians found that at least 13% met standards for Post-Traumatic Stress Disorder (PTSD; Klamen et al., 1995). The authors argued that the high prevalence of this disorder among physicians is due to the prolonged stress from traumatic events (Klamen et al., 1995).

Anesthesiologists have higher stress levels when compared to other physician specialties. Prior studies have shown that anesthesiologists are at an increased risk of developing mental disorders, alcohol, and drug dependencies, sleep disturbances, and suicidal ideations (Abut et al., 2012; Kumar, 2016; McCue, 1982). The impact of these negative effects on anesthesiologists may influence the success of surgeries, their response to trauma incidents, the quality of patient care, and patient survival.

Overall, this study potentially sheds light on the internal and external issues that anesthesiologists experience. Whether it is their workplace culture or simply their disposition, understanding anesthesiologists' work and targeting the factors that negatively influence their performance could help reduce errors and lapses.

Limitations

Notably, there were some limitations to the study that the researcher could not control. One limitation is that the data was not conducted in a traditional controlled laboratory setting but instead sent as an online link to a survey taken at the participant's convenience. Another

limitation is the participant sample; only anesthesiologists from the University of Chicago's Department of Anesthesia and Critical Care and Biological Sciences Collegiate Division and the University of Florida's Department of Anesthesiology were collected. Therefore, the study can only be generalized to academic anesthesiology departments. Furthermore, the reliability of the data depends on the reliability and validity of the instruments used to measure the predictors. All of the instruments used in the current study have been tested for reliability.

Response bias is another potential limitation as all participants may not have understood or perceived the question in the same way. One primary example is when a participant was asked to choose between "Strongly Agree" versus "Agree." It cannot be confirmed that every participant acknowledges the differences in these responses equally. Finally, using close-ended survey questions instead of open-ended questions can limit the participants' ability to choose the most appropriate answer.

Future Research

The current research provides a foundation for future researchers to build on. This study was the first to investigate the factors that predict an anesthesiologist's willingness to proceed with an anesthetic. Risk-taking, imposter syndrome, openness, and agreeableness were shown to be significant. Future research should examine these predictors and their effects on not just willingness but performance as well. While some of the predictors included did not show significance or were not investigated due to sample size, future research should still test these factors to determine if they influence physician behavior. The predictors examined in the study were formulated from prior research illustrating their effects on physician's thoughts and behaviors.

Other predictors should also be considered, such as burnout and the long-term effects of the Covid-19 pandemic. Current research already shows increased anxiety, PTSD, and fatigue among anesthesiologists (Vittori et al., 2021). This specialty of physicians was already at an increased risk for developing mental disorders. There is extensive data on the prevalence and effects of burnout in healthcare overall, but even more concerning is the higher rates of suicide among anesthesiologists as compared to other physician specialties (Bruce et al., 1968; Bruce et al., 1974; Lew, 1979). Jackson (1999) explained that the continued awareness of the possibility that death can occur even when there are no errors in patient care can contribute to the high stress anesthesiologists experience in everyday practice. Therefore, it is important to investigate how these doctors are coping.

Furthermore, anesthesiologists should be collected from a variety of academic institutions, private practice offices, and hospital settings. Perhaps there may be differences in how anesthesiologists operate in these different workplace settings. Do anesthesiologists who practice in academia have fewer medical errors than those who practice in hospitals? Future research should consider how workplace settings can contribute to how anesthesiologists operate and interact with patients.

Conclusion

The purpose of this study was to explore the factors that predict an anesthesiologist's willingness to proceed with an anesthetic. The overall goal was to create a prediction model that will help anesthesia professionals to understand the individual factors that affect their willingness to proceed with an anesthetic and why. The current study initially had a goal of testing 16 different factors that may significantly predict anesthesiologists' willingness to proceed with an anesthetic. These included demographic information such as gender, age, and ethnicity. Other

factors included were the number of adverse events experienced by physicians, a recent history of errors, physician specialty, personality (openness, conscientiousness, extraversion, agreeableness, and neuroticism), imposter syndrome, physician subspecialty, and perceived characteristics, organizational support and risk propensity, also called risk-taking.

Since the minimum participant requirements were not met, only six predictors were examined. The predictors that were not tested included: age, gender, and ethnicity, physician subspecialty, conscientiousness, extraversion, and neuroticism, and perceived organizational support. The independent variables that were tested included: the number of adverse events experienced by physicians, a recent history of errors, openness, agreeableness, imposter syndrome, and risk-taking. There were four different scenarios used to test an anesthesiologist's willingness to proceed with an anesthetic.

In scenario 1, imposter syndrome and risk-taking were significant predictors, which accounted for 19% of the variance and indicated a strong model fit. In scenario 2, the significant predictors were openness and agreeableness, which accounted for 21% of the variance, and the results of the model fit supported the validity of the model. Finally, in scenarios 3 and 4, no significant predictors were included in the final model.

While some of the predictors were not tested, future research should consider the influences of these factors on anesthesiologists' performance, behavior, and well-being. Overall, this study would provide a foundation that will help healthcare industry leaders develop and implement interventions that allow these physicians to express their experiences with each other, learn coping strategies, and inquire about external resources that may improve their mental and physical health.

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Appendix A – Willingness to Proceed with an Anesthetic

(Adopted from Rice at el., 2020)

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

1. I would be willing to proceed with the patient's case in this situation.

Strongly Disagree, Disagree, Neutral, Agree Strongly, Agree

2. I would be comfortable proceeding with the patient's case in this situation.

Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

3. I would have no problem proceeding with the patient's case in this situation.

Strongly Disagree, Disagree, Neutral, Agree, Strongly, Agree

4. I would be happy to proceed with the patient's case in this situation.

Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

5. I have no fear of proceeding with the patient's case in this situation.

Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

6. I feel confident proceeding with the patient's case in this situation.

Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

Appendix B – Demographic Questions

1. What is your gender?

- *Female*
- *Male*
- *Other _____*

2. What is your ethnicity?

- *Caucasian*
- *African descent (e.g., African American)*
- *Hispanic descent (e.g., Latin America)*
- *Asian descent*
- *Other _____*

3. What is your age?

4. Including the three years of residency, how many years of experience do you have practicing anesthesia?

- *<1*
- *1-3*
- *4-5*
- *6-10*
- *10-20*
- *>20*

5. Do you have additional specialty training following residency in anesthesia? If so, which specialty?

- *No*
- *Cardiothoracic*
- *Critical Care*
- *Neuroanesthesia*
- *Obstetric*

- *Pain*
- *Pediatrics*
- *Regional*
- *Transplant*
- *Trauma*
- *Other*

6. How many adverse events (airway complication, cardiac arrest, major morbidity, perioperative mortality) have you experienced in the last 3 months?

- *0*
- *1*
- *2*
- *3*
- *>3*

7. How many medical errors have you made in the last 3 months?

- *0*
- *1*
- *2*
- *3*
- *>3*

Appendix C – Mini International Personality Item Pool Scale

Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. Indicate for each statement how accurate the description is of you. Place only one check per row.

1. Seldom feel blue.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

2. Am not interested in abstract ideas.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

3. Am not really interested in others.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

4. Don't talk a lot.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

5. Keep in the background.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

6. Have difficulty understanding abstract ideas.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

7. Get upset easily.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

8. Like order.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

9. Have frequent mood swings.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

10. Talk to a lot of different people at parties.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

11. Often forget to put things back in their proper place.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

12. Have a vivid imagination.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

13. Am not interested in other people's problems.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

14. Am the life of the party.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

15. Do not have a good imagination.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

16. Make a mess of things.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

17. Feel others' emotions.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

18. Get chores done right away.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

19. Am relaxed most of the time.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

20. Sympathize with others' feelings.

Very Inaccurate, Moderately Inaccurate, Neither Inaccurate nor Accurate, Moderately Accurate, Very Accurate

Appendix D – Perceived Organizational Support Scale

Listed below are statements that represent possible opinions that you may have about working at your job. Indicate for each statement how accurate the description is of you.

1. The organization values my contribution to its well-being.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

2. The organization fails to appreciate any extra effort from me.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

3. The organization would ignore any complaint from me.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

4. The organization really cares about my well- being.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

5. Even if I did the best job possible, the organization would fail to notice.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

6. The organization cares about my general satisfaction at work.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

7. The organization shows very little concern for me.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

8. The organization takes pride in my accomplishments at work.

Strongly Disagree, Moderately Disagree, Slightly Disagree, Neither Disagree nor Agree, Slightly Agree, Moderately Agree, Strongly Agree

Appendix E – General Risk Propensity Scale (GRiPS)

Please respond to each of the statements below indicating how strongly you agree or disagree with each statement.

1. Taking risks makes life more fun.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

2. My friends would say that I'm a risk taker.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

3. I enjoy taking risks in most aspects of my life.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

4. I would take a risk even if it meant I might get hurt.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

5. Taking risks is an important part of my life.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

6. I commonly make risky decisions.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

7. I am a believer of taking chances.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

8. I am attracted, rather than scared, by risk.

   Strongly Disagree, Disagree, Neither Disagree nor Agree, Agree, Strongly Agree

Appendix F – Full Survey

Survey Study

CONSENT FORM

* Required

Age Verification

1. Are you at least 18 years of age? *

Mark only one oval.

- ◯ Yes
- ◯ No

Skip to section 18 (I'm sorry, but you must be 18 years of age to participate. Thank you for your time.)

Instructions

You will be asked some demographic questions and other questions regarding your individual characteristics. Following these questions, you will be presented with scenarios regarding potential medical procedures then asked some questions about it. The data collection process is anonymous and your responses will remain confidential.

Demographics

2. What is your gender?

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Other: _____

3. What is your Age?

_____

4. What is your ethnicity?

Mark only one oval.

- ◯ Caucasian
- ◯ African decent (e.g. African American)
- ◯ Hispanic decent (e.g. Latin America)
- ◯ Asian descent
- ◯ Other: _____

5. Including the three years of residency, how many years of experience do you have practicing anesthesia?

Mark only one oval.

- ◯ <1
- ◯ 1-3
- ◯ 4-5
- ◯ 6-10
- ◯ >20

6. Do you have additional specialty training following residency in anesthesia? If so, which specialty?

Mark only one oval.

- ◯ No
- ◯ Cardiothoracic
- ◯ Critical Care
- ◯ Neuroanesthesia
- ◯ Obstetric
- ◯ Pain
- ◯ Pediatrics
- ◯ Regional
- ◯ Transplant
- ◯ Trauma
- ◯ Other: _____

7. How many adverse events (airway complication, cardiac arrest, major morbidity, perioperative mortality) have you experienced in the last 3 months?

Mark only one oval.

- ◯ 0
- ◯ 1
- ◯ 2
- ◯ 3
- ◯ >3

8. How many medical errors have you made in the last 3 months?

Mark only one oval.

- 0
- 1
- 2
- 3
- >3

Please respond to each of the statements below indicating how strongly you agree or disagree with each statement.

9.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
I will be able to achieve most of the goals that I set for myself.					
When facing difficult tasks, I am certain that I will accomplish them.					
In general, I think that I can obtain outcomes that are important to me.					
I believe I can succeed at most any endeavor to which I set my mind.					
I will be able to successfully overcome many challenges.					

Please respond to each of the statements below indicating how strongly you agree or disagree with each statement.

10. *Mark only one oval per row.*

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
I tend to make excuses when I do something wrong.					
I tend to put things off until the last moment.					
I suppose I feel "under the weather" more often than most people.					
I always try to do my best, no matter what.					
I am easily distracted by noises or my own daydreaming when I try to read.					
I try not to get too intensely involved in competitive activities so I won't hurt too much if I lose or do poorly.					
I would do a lot better if I tried harder.					
I sometimes enjoy being mildly ill for a day or two.					
I tend to rationalize when I don't live up to others' expectations.					
I overindulge in food and drink more often then I should.					

Listed below are statements that represent possible opinions that you may have about working at your job.

11.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
The organization values my contribution to its well-being.	◯	◯	◯	◯	◯
The organization fails to appreciate any extra effort from me.	◯	◯	◯	◯	◯
The organization would ignore any complaint from me.	◯	◯	◯	◯	◯
The organization really cares about my well- being.	◯	◯	◯	◯	◯
Even if I did the best job possible, the organization would fail to notice.	◯	◯	◯	◯	◯
The organization cares about my general satisfaction at work.	◯	◯	◯	◯	◯
The organization shows very little concern for me.	◯	◯	◯	◯	◯
The organization takes pride in my accomplishments at work.	◯	◯	◯	◯	◯

Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. Indicate for each statement how accurate the description is of you.

12.

Mark only one oval per row.

	Very Inaccurate	Moderately Inaccurate	Neither Inaccurate nor Accurate	Moderately Accurate	Very Accurate
Seldom feel blue.	◯	◯	◯	◯	◯
Am not interested in abstract ideas.	◯	◯	◯	◯	◯
Am not really interested in others.	◯	◯	◯	◯	◯
Don't talk a alot.	◯	◯	◯	◯	◯
Keep in the background.	◯	◯	◯	◯	◯
Have difficulty understanding abstract ideas.	◯	◯	◯	◯	◯
Get upset easily.	◯	◯	◯	◯	◯
Like order.	◯	◯	◯	◯	◯
Have frequent mood swings.	◯	◯	◯	◯	◯
Talk to a lot of different people at parties.	◯	◯	◯	◯	◯
Often forget to put things back in their proper place.	◯	◯	◯	◯	◯
Have a vivid imagination.	◯	◯	◯	◯	◯
Make a mess of things.	◯	◯	◯	◯	◯

Am relaxed most of the time.					
Am not interested in other people's problems.					
Am the life of the party.					
Do not have a good imagination.					
Sympathize with others' feelings.					

For each question, please respond to the choice that indicates how true the statement is of you. It is best to give the first response that enters your mind rather than dwelling on each statement and thinking about it over and over.

13.

Mark only one oval per row.

	Not True at All	Rarely	Sometimes	Often	Very True
I have often succeeded on a test or task even though I was afraid that I would not do well before I undertook the task.					
I can give the impression that I'm more competent than I really am.					
I avoid evaluations if possible and have a dread of others evaluating me.					
When people praise me for something I've accomplished, I'm afraid I won't be able to live up to their expectations of me in the future.					
I sometimes think I obtained my present position or gained my present success because I happened to be in the right place at the right time or knew the right people.					
I'm afraid people important to me may find out that I'm not as capable as they think I am.					
I tend to remember the incidents in which I have not done my best more than those times I have done my best.					
I rarely do a project or task as well as I'd like to do it.					

At times, I feel my success has been due to some kind of luck.					
I'm disappointed at times in my present accomplishments and think I should have accomplished much more.					
Sometimes I'm afraid others will discover how much knowledge or ability I really lack.					
I'm often afraid that I may fail at a new assignment or undertaking even though I generally do well at what I attempt.					
When I've succeeded at something and received recognition for my accomplishments, I have doubts that I can keep repeating that success.					
If I receive a great deal of praise and recognition for something I've accomplished, I tend to discount the importance of what I've done.					
I often compare my ability to those around me and think they may be more intelligent than I am.					
I often worry about not succeeding with a project or examination, even though others around me have considerable confidence that I will do well.					
If I'm going to receive a promotion or gain recognition of					

some kind, I hesitate to tell others until it is an accomplished fact.					
I feel bad and discouraged if I'm not "the best" or at least "very special" in situations that involve achievement.					

Please respond to each of the statements below indicating how strongly you agree or disagree with each statement.

14.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Taking risks makes life more fun.					
My friends would say that I'm a risk taker.					
I enjoy taking risks in most aspects of my life.					
I would take a risk even if it meant I might get hurt.					
Taking risks is an important part of my life.					
I commonly make risky decisions.					
I am a believer of taking chances.					
I am attracted, rather than scared, by risk.					

For each statement, please indicate the option that accurately reflects your response.

15. *Mark only one oval per row.*

	Never	A Few Times a Year	Once a Month or Less	A Few Times a Month	Once a Week	A Few Times a Week	Everyday
I deal very effectively with the problems of my patients.	◯	◯	◯	◯	◯	◯	◯
I feel I treat some patients as if they were impersonal object.	◯	◯	◯	◯	◯	◯	◯
I feel emotionally drained from my work.	◯	◯	◯	◯	◯	◯	◯
I feel fatigued when I get up in the morning and have to face another day on the job.	◯	◯	◯	◯	◯	◯	◯
I've become more callous towards people since I took this job.	◯	◯	◯	◯	◯	◯	◯
I feel I'm positively influencing other people's lives through my work.	◯	◯	◯	◯	◯	◯	◯
Working with people all day is really a strain for me.	◯	◯	◯	◯	◯	◯	◯

I feel exhilarated after working closely with my patients.	⬭	⬭	⬭	⬭	⬭	⬭	⬭

A 67-year-old man with a history of esophageal cancer treated with chemotherapy and radiation is scheduled for a right thoracoscopic wedge resection for a pulmonary nodule. During a previous anesthetic about 2 months ago, the patient was found to have significant stenosis of his airway. A 6.0 mm endotracheal tube was the largest tube that could be inserted.

16. Based on the scenario stated above, please respond how strongly you agree or disagree with the following statements.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be willing to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would be comfortable performing the procedure in this situation.	◯	◯	◯	◯	◯
I would have no problem performing the procedure in this situation.	◯	◯	◯	◯	◯
I would be happy to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would feel safe performing the procedure in this situation.	◯	◯	◯	◯	◯
I have no fear of performing the procedure in this situation.	◯	◯	◯	◯	◯
I feel confident performing the procedure in this situation.	◯	◯	◯	◯	◯

An 88-year-old woman who fell at home is scheduled for an urgent hip open reduction and internal fixation. She has a history of severe aortic stenosis with a valve area of 0.8cm2. Her exercise tolerance is less than 4 METS and she has had a recent syncopal episode.

17. Based on the scenario stated above, please respond how strongly you agree or disagree with the following statements.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be willing to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would be comfortable performing the procedure in this situation.	◯	◯	◯	◯	◯
I would have no problem performing the procedure in this situation.	◯	◯	◯	◯	◯
I would be happy to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would feel safe performing the procedure in this situation.	◯	◯	◯	◯	◯
I have no fear of performing the procedure in this situation.	◯	◯	◯	◯	◯
I feel confident performing the procedure in this situation.	◯	◯	◯	◯	◯

A 54-year-old man with acute appendicitis is scheduled for a laparoscopic appendectomy. He was recently diagnosed with a pheochromocytoma based on significantly elevated plasma metanephrine level. He complains of frequent episodes of headache, chest pain, and shortness of breath. He has yet to visit his surgeon and has not yet begun alpha antagonist medications.

18. Based on the scenario stated above, please respond how strongly you agree or disagree with the following statements.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be willing to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would be comfortable performing the procedure in this situation.	◯	◯	◯	◯	◯
I would have no problem performing the procedure in this situation.	◯	◯	◯	◯	◯
I would be happy to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would feel safe performing the procedure in this situation.	◯	◯	◯	◯	◯
I have no fear of performing the procedure in this situation.	◯	◯	◯	◯	◯
I feel confident performing the procedure in this situation.	◯	◯	◯	◯	◯

A 79-year-old woman has a significant history of peripheral vascular disease with claudication and chronic lower extremity wounds. She is scheduled for an urgent femoral to popliteal bypass to avoid a future amputation. She has a history of hyponatremia and carries a diagnosis of inappropriate antidiuretic hormone syndrome. Over the last few months, her sodium has ranged from 125-132 mmol/L. Labs today reveal a sodium of 125 mmol/L.

19. Based on the scenario stated above, please respond how strongly you agree or disagree with the following statements.

Mark only one oval per row.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be willing to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would be comfortable performing the procedure in this situation.	◯	◯	◯	◯	◯
I would have no problem performing the procedure in this situation.	◯	◯	◯	◯	◯
I would be happy to perform the procedure in this situation.	◯	◯	◯	◯	◯
I would feel safe performing the procedure in this situation.	◯	◯	◯	◯	◯
I have no fear of performing the procedure in this situation.	◯	◯	◯	◯	◯
I feel confident performing the procedure in this situation.	◯	◯	◯	◯	◯

Please read the following prompt and provide your response.

20. Are there any other factors that affected your willingness to perform the procedures?

Appendix G – Model Summary: Scenario 1

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.481	.231	.116	.79675
2	.480	.230	.136	.78746
3	.464	.215	.140	.78561
4	.437	.170	.132	.78808
5	.412	.191	.135	.78941

Predictors: (Constant), MedicalErrors, Agreeableness, AdverseEvents, Openness, RiskTaking, ImposterSyndome

Predictors: (Constant), Agreeableness, AdverseEvents, Openness, RiskTaking, ImposterSyndrome

Predictors: (Constant), Adverse Events, Openness, RiskTaking, ImposterSyndrome

Predictors: (Constant), Openness, RiskTaking, ImposterSyndrome

Predictors: (Constant), RiskTaking, ImposterSyndrome

Appendix H – *F* Values and Significance: Scenario 1

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.635	6	1.272	2.004	.088
	Residual	25.393	40	.635		
	Total	33.027	46			
2	Regression	7.603	5	1.521	2.452	.049
	Residual	25.424	41	.620		
	Total	33.027	46			
3	Regression	7.106	4	1.776	2.878	.034
	Residual	25.922	42	.617		
	Total	33.027	46			
4	Regression	6.321	3	2.107	3.393	.026
	Residual	26.706	43	.621		
	Total	33.027	46			
5	Regression	5.607	2	2.804	4.499	.017
	Residual	27.420	44	.623		
	Total	33.027	46			

Dependent Variable: Scenario 1

Predictors: (Constant), MedicalErrors, Agreeableness, AdverseEvents, Openness, RiskTaking, ImposterSyndrome

Predictors: (Constant), Agreeableness, Adverse Events, Openness, RiskTaking, ImposterSyndrome

Predictors: (Constant), AdverseEvents, Openness, RiskTaking, ImposterSyndrome

Predictors: (Constant), Openness, RiskTaking, ImposterSyndrome

Predictors: (Constant), RiskTaking, ImposterSyndrome

Appendix I – Model Summary: Scenario 2

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.508	.258	.123	.85333
2	.505	.255	.145	.84250
3	.502	.252	.166	.83214
4	.491	.241	.177	.82657
5	.462	.213	.171	.82992

Predictors: (Constant), RiskTaking, AdverseEvents, MedicalErrors, Agreeablesness, Openness, ImposterSyndrome

Predictors: (Constant), RiskTaking, AdverseEvents, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), Agreeableness, Openness

Appendix J – *F* Values and Significance: Scenario 2

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.359	6	1.393	1.913	.108
	Residual	24.030	33	.728		
	Total	32.389	39			
2	Regression	8.255	5	1.651	2.326	.064
	Residual	24.134	34	.710		
	Total	32.389	39			
3	Regression	8.153	4	2.038	2.943	.034
	Residual	24.236	35	.692		
	Total	32.389	39			
4	Regression	7.793	3	2.598	3.802	.018
	Residual	24.596	36	.683		
	Total	32.389	39			
5	Regression	6.904	2	3.452	5.012	.012
	Residual	25.485	37	.689		
	Total	32.389	39			

Dependent Variable: Scenario 2

Predictors: (Constant), RiskTaking, AdverseEvents, MedicalErrors, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), RiskTaking, AdverseEvents, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), Agreeableness, Openness

Appendix K – Model Summary: Scenario 3

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.335	.112	-.049	1.01219
2	.328	.107	-.024	.99982
3	.305	.093	-.011	.99330
4	.291	.085	.008	.98351
5	.245	.060	.009	.98391
6	.196	.038	.013	.98167
7	.000	.000	.000	.98810

Predictors: (Constant), RiskTaking, AdverseEvents, MedicalErrors, Agreeablesness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, MedicalErrors, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, MedicalErrors, Agreeableness, Openness

Predictors: (Constant), AdverseEvents, Agreeableness, Openness

Predictors: (Constant), AdverseEvents, Openness

Predictors: (Constant), Openness

Predictors: (Constant)

Appendix L – *F* Values and Significance: Scenario 3

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.268	6	.711	.694	.656
	Residual	33.809	33	1.025		
	Total	38.077	39			
2	Regression	4.089	5	.818	.818	.545
	Residual	33.988	34	1.000		
	Total	38.077	39			
3	Regression	3.545	4	.886	.898	.476
	Residual	34.532	35	.987		
	Total	38.077	39			
4	Regression	3.227	3	1.076	1.111	.357
	Residual	34.851	36	.968		
	Total	38.077	39			
5	Regression	2.287	2	1.144	1.182	.318
	Residual	35.790	37	.967		
	Total	38.077	39			
6	Regression	1.457	1	1.457	1.512	.226
	Residual	36.620	38	.964		
	Total	38.077	39			
7	Regression	.000	0	.000		
	Residual	38.077	39	.976		
	Total	38.077	39			

Dependent Variable: Scenario 3

Predictors: (Constant), RiskTaking, AdverseEvents, MedicalErrors, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, MedicalErrors, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, MedicalErrors, Agreeableness, Openness

Predictors: (Constant), AdverseEvents, Agreeableness, Openness

Predictors: (Constant), AdverseEventss, Openness

Predictors: (Constant), Opennnesss

Predictors: (Constant)

Appendix M – Model Summary: Scenario 4

(Model Summary)

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.366	.134	-.023	.77522
2	.366	.134	.007	.76378
3	.366	.134	.035	.75288
4	.349	.122	.049	.74746
5	.320	.102	.054	.74544
6	.258	.066	.042	.75007
7	.000	.000	.000	.76628

Predictors: (Constant), RiskTaking, AdverseEvents, MedicalErrors, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), RiskTaking, AdverseEvents, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, Openness

Predictors: (Constant), AdverseEvents

Predictors: (Constant)

Appendix N – *F* Values and Significance: Scenario 4

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.068	6	.511	.851	.540
	Residual	19.832	33	.601		
	Total	22.900	39			
2	Regression	3.066	5	.613	1.051	.404
	Residual	19.839	34	.583		
	Total	22.900	39			
3	Regression	3.061	4	.765	1.350	.271
	Residual	19.839	35	.567		
	Total	22.900	39			
4	Regression	2.787	3	.929	1.663	.192
	Residual	20.133	36	.559		
	Total	22.900	39			
5	Regression	2.340	2	1.170	2.105	.136
	Residual	20.560	37	.556		
	Total	22.900	39			
6	Regression	1.521	1	1.521	2.704	.105
	Residual	21.379	38	.563		
	Total	22.900	39			
7	Regression	.000	0	.000		
	Residual	22.900	39	.587		
	Total	22.900	39			

Dependent Variable: Scenario 4

Predictors: (Constant), RiskTaking, AdverseEvents, MedicalErrors, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, MedicalErrors, Agreeableness, Openness, ImposterSyndrome

Predictors: (Constant), AdverseEvents, MedicalErrors, Agreeableness, Openness

Predictors: (Constant), AdverseEvents, Agreeableness, Openness

Predictors: (Constant), AdverseEventss, Openness

Predictors: (Constant), Opennnesss

Predictors: (Constant)