A Multiple Regression Analysis of Personality's Impact on Actuarial Exam Performance

The Honors Program
Senior Capstone Project
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ABSTRACT

Existing literature indicates that there is some connection between personality and both academic and work-related performance. The author's intent for the research described herein is to explore this connection for students majoring in actuarial mathematics with regard to their performance on actuarial certification exams. Specifically, using the five-factor model of personality, the author seeks to predict the number of attempts required to pass the first two exams in the process (Exam 1/P - probability; Exam 2/FM - financial mathematics) using measures of the five dimensions of the five-factor model (openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability) through regression analysis. The author also examined the same variables' effect on a binary passing indicator. The sample consists of 100 actuarial mathematics majors at three universities in southern New England. Although the results are not conclusive, it appears that conscientiousness correlates positively with performance and neuroticism correlates negatively with performance. In the future, the author suggests research with a larger sample size and an examination of non-linear relationships.

INTRODUCTION

The Actuarial profession is considered one of the top professions, rated number one by CareerCast.com in 2010 and consistently near the top in other rankings ("Actuary" is Rated…, 2010; Strieber). It requires a rigorous testing process for full certification, starting with tests on calculus, probability, statistics, interest theory, and market derivatives. The actuarial exams, particularly 1/P and 2/FM, are primarily academic measures of how well actuarial candidates understand the statistical and financial concepts required for actuarial work. These principles are also the primary concern of the first few years of undergraduate actuarial programs. However, the ability to pass them is generally regarded by employers as an indication of potential job performance. It would be beneficial to college professors or actuarial program recruiters to have some indication of actuarial candidates' future performance.

Personality factors are sometimes used to attempt to predict future academic or job performance. In general, it appears that personality does have predictive value (Noftle & Robins, 2007; Oh & Berry, 2009; Salgato, 2003). However, there is currently little or no research on personality's ability to predict future performance specifically in the actuarial profession. It should be possible to predict the number of attempts required to obtain a passing grade on actuarial exams using measures of personality characteristics. The intent of this research is to examine the impact of the five-factor model's personality measures on predicting the number of attempts required to pass the first two actuarial exams, 1/P and 2/FM.

BACKGROUND INFORMATION

The Actuarial Exam Process

In order to receive the actuarial designation, a candidate must pass a series of certification exams. There are two major societies in the United States that issue actuarial designations: the Society of Actuaries and the Casualty Actuarial Society. The former is primarily for actuaries who wish to enter the life and health insurance field, whereas the latter is primarily for actuaries who wish to enter the property and casualty insurance field. The first five exams are

offered jointly by the two societies, as the material is nearly identical. After the fifth exam, an actuarial candidate must choose which of the two society's designations he or she wishes to pursue (Actuarial Exams, 2010).

The first exam, Actuarial Exam 1/P, centers on probability and statistics, which also assumes proficiency in calculus and basic knowledge of risk and insurance. The purpose of this exam is to "develop knowledge of the fundamental probability tools for quantitatively assessing risk" (Probability Exam, p. 1). The exam is 3 hours in length and consists of 30 multiple-choice questions. It is administered as a computer-based test, although traditional paper exams are still offered (Probability Exam).

The second exam, Actuarial Exam 2/FM, centers on financial mathematics, which also assumes proficiency in calculus and basic knowledge of probability. The purpose of this exam is to provide an understanding of the valuation of cash flows over time and of financial instruments, including market derivatives, such as puts, calls, and forward contracts. The exam is 3 hours in length and consists of 35 multiple-choice questions. It is also administered as a computer-based test with traditional exams also still offered. (Financial Mathematics Exam).

Both exams are graded on a 10-point scale, with 6 as the lowest passing grade. In recent sittings, the pass rate tends to be just over 40% for Exam 1/P and just over 50% for Exam 2/FM (Society of Actuaries, 2010).

The Five-Factor Model of Personality

The five-factor model of personality centers on the idea that personality differences can be captured in terms of five broad, independent dimensions known as the Big Five personality factors. The Big Five personality factors are openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability, which is also called neuroticism A person is thought to have more or less of each trait rather than either having the trait or not (Cervone & Pervin, 2010).

A person who is high in openness will be curious, have broad interests, and be creative, original, and imaginative. A person who is low will be conventional, not analytical, and have

narrow interests. A person who is high in conscientiousness will be organized, reliable, hard-working, and disciplined. A person who is low will be careless, negligent, and hedonistic. High extraversion corresponds to sociability, talkativeness, and optimism. Low extraversion corresponds to a task-orientation, quietness, and a reserved nature High agreeableness corresponds to being trustworthy, helpful, and good-natured. Low agreeableness corresponds to being suspicious, manipulative, and irritable. Finally, neuroticism or emotional instability relates to nervousness, emotionality, and insecurity, whereas emotional stability relates to calmness, security, and a relaxed nature (Cervone & Pervin, 2010).

The Five-Factor Model is one of the leading personality theories today, and is perhaps the most popular in research (Myers, 2008). It has spurred researchers to produce questionnaires and inventories to measure the five dimensions. Among these, one that is widely used is the NEO Personality Inventory Revised (NEO-PI-R), developed by Costa and McCrae. It consists of 240 items that ask a person to rate agreement or disagreement with a series of statements on a five-point scale. The NEO Five Factor Inventory (NEO-FFI) is a smaller version of the NEO-PI-R that does not include measures of individual facets but is only 60 items and therefore can be completed in a shorter period of time (McCrae & Costa, 2010; Cervone & Pervin, 2010; Widiger & Trull, 1997).

LITERATURE REVIEW

Personality and Academic Performance

Personality has been found to predict academic performance in several studies. Particularly, conscientiousness has been found to predict academic performance and GPA in both high school and college (Poropat, 2009; Noftle & Robins, 2007). One meta-analysis found this relationship to be consistent and stable across studies with a cumulative sample size of over 70,000, primarily at the level of tertiary education. Additionally, the relationship between tertiary education performance and conscientiousness was independent of intelligence and remained after controlling for secondary education (Poropat, 2009). The link between conscientiousness and college GPA remains after controlling for both high school GPA and SAT scores (Noftle & Robins, 2007).

Conscientiousness has been linked to academic performance as a predictor of exam performance, essay performance, continuous assessment by instructors, and performance on supervised dissertations. Although not as strongly, neuroticism has been found to negatively predict academic performance, especially where the primary measure of academic performance was a final examination. Extraversion has been found to correlate positively with academic performance in primary and secondary education, but negatively in tertiary education, especially where independent studying is the primary learning mechanism. Findings regarding openness are inconsistent, but some studies have found it to correlate with performance (Furnham, Monsen, & Ahmetoglu, 2009).

There is also evidence that personality may have more to do with performance than cognitive ability. In a study involving performance on a statistics examination, conscientiousness explained 12% of the variance on test scores whereas cognitive ability measures explained only 3% (Furnham & Chamorro-Premuzic, 2004, p. 1). Conscientiousness was again found correlated with performance, and extraversion was found to correlate negatively with performance (Furnham & Chamorro-Premuzic, 2004).

One study in particular found results that run contrary to most other findings. In that study, emotional stability was found to predict course grade in an introduction to psychology course, while none of the other four factors were significant. The authors of this study acknowledged that these findings run counter to their expectations based on other studies, and that the results may be partly due to the particular population used in the study, namely, entirely comprised of college freshman in a single introductory course at a single college. They cite maturity levels and study habits as possible factors that may have overwhelmed any personality effects that might have been present (Ridgell & Lounsbury, 2004).

In summary, personality has been linked to various measures of academic performance. Although conscientiousness is typically the most reliable predictor, emotional stability, openness, and extraversion have been linked in some studies. To the author's knowledge, agreeableness has not been found to correlate with academic performance.

Personality and Job Performance

Personality has also been found to predict job performance across several studies, and again, conscientiousness appears to be the primary predictor. One meta-analysis found conscientiousness to predict job performance, with relationships among the other personality factors and job performance dependant present in certain occupations, across studies with a cumulative sample size of almost 24,000 (Barrick & Mount, 1991). Another meta-analysis corroborated this result, finding conscientiousness to predict job performance in professional occupations and finding conscientiousness and emotional stability to predict job performance in skilled and semi-skilled occupations (Ones, Dilchert, Viswesvaran, & Judge, 2007).

Other studies find similar results. One examined personality in relation to general career success, both in terms of job satisfaction and external measures of success such as income and occupational status. The study found conscientiousness to predict both and neuroticism to predict external measures. These results persisted after controlling for mental ability (Judge, Higgins, Thoresen, & Barrick, 1999). Another compared the five-factor model to other personality models. The five-factor model was found to contribute more to the prediction of job performance, and conscientiousness and emotional stability were again found to be the two significant factors (Salgato, 2003).

One finding suggests that agreeableness has an interaction effect on conscientiousness's predictive ability in certain situations. The study's results found conscientiousness measures to have greater predictive power when the subjects had higher agreeableness measures when job functions required cooperative interaction with colleagues (Witt, Burke, Barrick, & Mount, 2002).

Personality has also been found to have predictive value for managerial performance (Oh & Berry, 2009).

Why Should Personality Predict Performance?

At first, it would seem that intelligence and ability would be the primary predictors of performance, particularly in academic spheres. However, these factors relate to the maximum possible performance, whereas personality relates more to the actual performance that occurs (Furnham et al., 2009; Marcus, Goffin, Johnston, & Rothstein, 2007). Put differently, ability

indicates what a person is able to do, but personality indicates what a person will do. Personality may become especially important within populations of relatively homogeneous ability and intelligence (Furnham et al., 2009).

For example, all actuarial majors were able to gain admittance to college, and the population should be better than average at mathematics. This would indicate that the ability of actuarial students is similar internally and also different than the general population, which should make differences in personality more pronounced.

Also, it is worth mentioning that personality appears to predict student GPA and job performance equally well. One study found that the correlations between personality and job performance and between personality and GPA were nearly identical (Lounsbury, Gibson, Sundstrom, Wilburn, & Loveland, 2004).

CURRENT STUDY

In the current study the author sought to relate personality to actuarial exam performance. Actuarial exams are an academic measure, but are also considered to indicate future job performance. Because personality predicts both of these things, it should predict actuarial exam performance. Surveys were administered to actuarial mathematics majors to gather data for this study. The hypothesis examined was that personality, particularly conscientiousness and neuroticism would correlate with performance.

METHODOLOGY

Participants

Data were obtained from Actuarial Mathematics majors (n=100) at three universities: 57 from Bryant University (23 junior, 34 senior), 13 from University of Connecticut (8 junior, 5 senior), and 30 from Worcester Polytechnic Institute (15 junior, 15 senior). All three of the universities have actuarial programs. Because the investigation of differences among the three universities' populations is beyond the scope of this study, except in regard to controlling for in-class exposure to the exam material, any demographic heterogeneity that may be present within the sample due to school differences should not affect the results.

Measures

The data collected in these surveys consist of the following items:

- NEO-FFI-3 responses for personality scoring (McCrae & Costa, 2010)
- How many attempts the student has made at each exam (1/P and 2/FM) and whether the student has passed each
- Estimate of how much of the material for each exam the student had seen specifically in classes at his/her respective university before sitting for the exam
- Estimate of how much of the material for each exam the student had seen specifically in classes at his/her respective university at the time of passing, if the student had passed
- Estimate of how much of the material for each exam the student had seen in total at his/her respective university before sitting for the exam
- Estimate of how much of the material for each exam the student had seen in total at his/her respective university at the time of passing, if the student had passed
- Gender
- Class (junior or senior)
- Approximate cumulative GPA

For the estimation of material studied, respondents were given four quartiles to choose from: 0-25%, 25-50%, 50-75%, and 75-100%.

For the full survey, see Appendix D.

Procedures

At Bryant University, surveys were distributed in students' classes with the professors' permission. At University of Connecticut, surveys were distributed in an actuarial club's regular meeting. At Worcester Polytechnic Institute, surveys were distributed during a one hour block of time where students could come as they were able to, which they were notified of beforehand. Any students who were not able to make this time block were asked to take it in their own time, which several did.

Students were allowed to opt out of taking the survey, but the opt out rather than opt in format of survey distribution at Bryant and WPI allowed us some protection against response bias. University of Connecticut responses could potentially reflect a response bias, because only

those students who are members of the club and who showed up to that particular club meeting were included.

Personality factors were scored on a 49-point scale from 0 to 48, in accordance with formal scoring methodology. Each of the 60 questions related to one of the five factors (12 questions each). For a given question, respondents could select Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree. These correspond to values 0 through 4, although some were reverse scored. All response values for a given factor were summed to arrive at the factor score.

Data analysis was then performed using multiple regression in MiniTab, a statistical analysis software. Best subsets methodology was the primary focus, wherein the statistical package found the subset of variables that produced the lowest p-value, or highest statistical significance.

Independent variables include the five scores from the personality inventory. In the first set of analyses, the dependent variable was the number of attempts required to pass the exam; separate analyses were performed for each of the two actuarial exams. In the second set of analyses, the dependent variable was a binary indicator for whether the student had passed or not passed at least one exam (coded as 1 and 0 for passed or not passed, respectively); separate analyses were performed for juniors, seniors, and those who had studied at least 50% of the material for Exam P prior to their first attempt.

P-values of the resulting regression equations, the equations themselves, and coefficients of determination were all reviewed to obtain the best set of predictor variables. For the regression analyses where the Y-value was non-binary, the normality of the error terms was also considered. Error term normality was rated good, ok, or bad.

In some cases, certain trials had one or more data points with high leverage, meaning that the single point could potentially skew the results. In these cases, the high-leverage values were temporarily removed and the results were re-calculated. If the modified results showed improvement, they were included in the results charts and marked with "mod."

RESULTS & ANALYSIS

Results I: Personality versus Number of Attempts

This section displays the results of regression analyses involving the five personality measures and the number of attempts required to pass the exam. This would ideally reveal what personality factors are associated with passing a given exam with greater efficiency. Data were only used from respondents who have successfully passed the exam.

Exam P

Table A1 in Appendix A shows the *p*-values, R^2 values, and error term normality ratings for the five personality variables as individual predictors of Exam P attempts. Only those respondents who had passed Exam P were included, because if a student had not passed Exam P, there was no way of knowing the total number of attempts it would eventually take that student.

Only neuroticism appears to be predictive of the number of attempts with any reliability. The *p*-value for the modified regression was 0.07, which is relatively very good. The next-best predictor was openness to experience with a *p*-value of 0.40.

The neuroticism regression seems to indicate that lower emotional stability (higher neuroticism score) correlates positively with the number attempts required to pass Exam P. The coefficient of 0.055 implies that approximately 18 points' difference on the 48-point neuroticism scale is the equivalent of one full attempt, or in other words, if two students are 18 points apart on the neuroticism scale, the lower scorer will require one less attempt to pass Exam P, all else being equal. The R^2 of 6.4% indicates that 6.4% of the observed variation in the number of attempts was due to differences in neuroticism.

An analysis with neuroticism as a predictor of attempts was also conducted where five data points were removed based on the amount of material studied. Those students who had studied less than 50% of the material in total before attempting Exam P the first time were removed. With only students who had studied most of the material to start with, the effects of preparation level on performance were partially countered. The results were nearly identical to the unfiltered results.

Table A2 in Appendix A shows the *p*-values, R^2 values, and error term normality ratings for select combinations of variables as predictors of Exam P attempts. These combinations were chosen by a best subsets analysis. The neuroticism and agreeableness together seem to be somewhat valid predictors of Exam P attempts, with a *p*-value of 0.11 after high-leverage data points were removed.

Interaction effects were also investigated briefly. A correlation matrix reveals that certain pairs of personality variables were at least somewhat correlated. For those correlated pairs where the basic combination seemed to have a relationship to attempts in the prior part of this analysis, an interaction variable was created by multiplying the two variables together, and an additional regression analysis was performed. Table A3 in Appendix A contains the results.

The interaction of neuroticism and agreeableness appears to be a valid predictor of Exam P attempts, with a *p*-value of 0.03. The R^2 of 8.2% indicates that 8.2% of the observed variation in attempts could be explained via this interaction variable. This pair is the same pair that appeared most valid in the analysis of simple (non-interaction) pairs of variables as predictors.

Exam FM

Table A4 in Appendix A shows the *p*-values, R^2 values, and error term normality ratings for the five personality variables as individual predictors of Exam FM attempts. None of the variables individually appear to be very significant predictors, although neuroticism and agreeableness are somewhat reliable, with *p*-values of 0.16 and 0.12, respectively.

The coefficient of neuroticism in its regression analysis implies a negative correlation between neuroticism and attempts, which would indicate that lower neuroticism (higher emotional stability) is predictive of more attempts required to pass Exam FM.

Agreeableness is the opposite; its coefficient implies a positive correlation between agreeableness and attempts, which would indicate that a more agreeable personality is predictive of more attempts required to pass Exam FM.

Table A5 in Appendix A shows the *p*-values, R^2 values, and error term normality ratings for select combinations of variables as predictors of Exam FM attempts. These combinations

were chosen by a best subsets analysis. The combination of openness to experience and agreeableness appears to be the only combination that is reasonably reliable as a predictor of attempts, with a *p*-value of 0.08. The R^2 of 18.0% indicates that 18% of the observed variation in the number of attempts was due to differences in these two measures.

In all cases where respondents had passed Exam FM, the respondents had studied at least 50% of the material in total before their first attempts. Therefore, no additional analysis was performed to counter preparation level differences.

Interaction effects were also investigated briefly. A correlation matrix reveals that certain pairs of personality variables were at least somewhat correlated. For those correlated pairs where the basic combination seemed to have a relationship to attempts, an interaction variable was created by multiplying the two variables together, and an additional regression analysis was performed. Table A6 in Appendix A contains the results.

While several interaction pairs appear to be valid predictors of Exam FM attempts, the best appears to be the interaction of openness to experience and agreeableness, with a *p*-value of 0.02. The R^2 of 17.8% indicates that 17.8% of the observed variation in attempts could be explained via this interaction variable. This pair is the same pair that appeared most valid in the analysis of simple (non-interaction) pairs of variables as predictors.

Results II: Personality and General Passing Efficiency

This section displays the results of regression analyses involving the five personality measures and a binary passing indicator of whether the respondent has passed either Exam P or Exam FM (1 for having passed at least one exam and 0 for passing neither). This would ideally reveal what personality factors are associated with passing or not passing by a given point in time. The resulting equations in this section, rather than producing an estimated number of attempts, instead produce a kind of pseudo-probability between 0 and 1. As a side note, there were no students in this dataset who had passed Exam FM but not Exam P.

Data from all respondents were used for the first part, which grouped respondents into homogeneous sets based on class year. For the second part, which grouped respondents into homogeneous sets based on amount of material studied before attempting Exam P, only data

from respondents who had attempted Exam P were used. This was because only those who had attempted Exam P were asked to indicate the amount of Exam P material they had studied.

Grouped by Class

Tables B1 and B4 in Appendix B show the *p*-values, R^2 values, and equations for the five personality variables as individual predictors of the binary passing indicator. Results were grouped separately by class (junior or senior, respectively).

For juniors, only conscientiousness appears to be predictive of passing, with a *p*-value of 0.09. The R^2 of 6.6% indicates that 6.6% of the observed variation in the pass/not pass indicator was due to differences in conscientiousness. Neuroticism also appears related, though the results may not be as valid as for conscientiousness, with its *p*-value is 0.13.

The coefficient of conscientiousness implies a positive correlation between conscientiousness scores and passing. The negative constant seems to suggest that a student has little to no chance of passing an exam by junior year without a sufficiently high conscientiousness score.

Table B2 in Appendix B shows the *p*-values, R^2 values, and equations for select combinations of variables as predictors of the binary passing indicator. These combinations were chosen by a best subsets analysis. The best appears to be a combination of conscientiousness and openness to experience, with a *p*-value of 0.08. It explains 11% of the observed variation in the binary passing indicator.

Interaction effects were also investigated briefly. Interaction variables were created as before, along with one extra; the results, along with an explanation for the extra interaction variable, can be found in Table B3 of Appendix B.

The interaction of conscientiousness and openness to experience appears to be a valid predictor of the binary passing indicator, with a *p*-value of 0.04. Several other pairs appear to be somewhat valid, though not to the same degree. The other pairs include neuroticism and openness, neuroticism and conscientiousness, and agreeableness and conscientiousness.

For seniors, neuroticism appears a fairly valid predictor, with a *p*-value of 0.10, and conscientiousness is close with a *p*-value of 0.14. The coefficient of neuroticism implies a negative relationship; the more emotionally stable a student is (lower neuroticism score), the more likely the student is to have passed an exam. The coefficient of conscientiousness implies a positive relationship; the more conscientious a student is, the more likely the student is to have passed an exam.

Table B5 in appendix B shows the *p*-values, R^2 values, and equations for select combinations of variables as predictors of the binary passing indicator. These combinations were chosen by a best subsets analysis. None of the combinations appear to be valid. However, two of the combinations (neuroticism and conscientiousness, with and without agreeableness) have *p*-values just over 0.11. In any case, the addition of agreeableness does not appear to contribute anything to the results.

Interaction effects were also investigated briefly. Interaction variables were created as before, along with one extra; the results, along with an explanation for the extra interaction variable, can be found in Table B6 of Appendix B.

The interaction of neuroticism and conscientiousness appears most valid with a *p*-value of 0.05. Additionally, the interaction of neuroticism and agreeableness is close behind with a *p*-value of 0.09.

Grouped by Material Studied

Table B7 in Appendix B shows the p-values, R^2 values, and equations for the five personality variables as individual predictors of the binary passing indicator. Results are only for data points where respondents had attempted Exam P and studied at least half of the material before attempting it. This should restrict the data set to only those students who were at least mostly prepared for the exam every time they took it.

None of the personality variables seem to be valid predictors of the binary passing indicator. Neuroticism, openness to experience, and conscientiousness all seem to have some relationship with the binary passing indicator, but their *p*-values are not very low; all are around 0.18.

Table B8 in Appendix B shows the *p*-values, R^2 values, and equations for select combinations of variables as predictors of the binary passing indicator. These combinations were chosen by a best subsets analysis. None of the results appear to be valid. The best combination is conscientiousness and openness to experience, with a *p*-value of 0.16.

Interaction effects were also investigated briefly. None of the three variables revealed to be somewhat related had any significant correlation with each other, but pair-wise interaction among them was investigated anyway and an additional regression analysis was performed. Table B9 in Appendix B contains the results. Two interaction variables, conscientiousness with neuroticism and conscientiousness with openness to experience, show quite low *p*-values (0.07 and 0.06, respectively).

Results III: Looking Further

The author also investigated several alternate avenues for examining the data. Although the results were not significant, the avenues explored bear mentioning.

Weighting the Binary Indicator by Attempts

One further analysis that was attempted was to combine the two types of analyses already completed. The binary Exam P passing indicator was modified to be weighted by the number of attempts made. Because the test is similar to a geometric progression (successive failures until a pass is achieved), the scale was made to be similarly geometric. A first-attempt pass was given the value of 1, a second-attempt pass was 0.5, a third-attempt pas was 0.25, and so on. Each successive failure earned an additional 0.5 multiplicative modifier. Again, data was grouped into homogeneous sets based on year or amount of material studied. In none of these cases were the results significantly valid for any of the five personality variables or combinations of variables.

Interestingly, when the whole data set was considered rather than a homogenous subset, the results improved. A regression analysis using the best combination of variables, conscientiousness and neuroticism, as predictors of the weighted indicator produced a *p*-value of 0.046. When an interaction variable was created by multiplying the conscientiousness score by a reverse-scale neuroticism score, the *p*-value dropped to 0.011. However, because this analysis was not performed on a homogeneous set, the meaning of these results is unclear.

Bryant and WPI Subsets

The author also sought to repeat the analyses on subsets of the data parsed by school. This was a further effort to ensure data set homogeneity by eliminating the possibility of differences between school, even though such factors should not have affected results anyway. The series of analyses described in Results parts I and II were performed with the data limited to Bryant University and then again with the data limited to Worcester Polytechnic Institute. In both scenarios, the results for a given analysis were categorically worse than the full three-college analysis equivalents. None of the results appeared to have statistically valid p-values.

SUMMARY OF KEY RESULTS

In predicting Exam P attempts, neuroticism was the only significant single predictor, though two outliers had to be removed before such a result was gained. However, the interaction of neuroticism and agreeableness was even better, and did not require any outlier deletion. Neuroticism and agreeableness both have a positive correlation with the number of attempts.

In predicting Exam FM attempts, though individual factors appear not to be significant predictors, the combination of agreeableness and openness to experience seems to be valid, and the interaction of the two seems even better. However, with only 29 data points, one might question whether the results are based on a large enough sample to justify generalizing the results. If valid, agreeableness has a positive correlation with the number of attempts and openness to experience has a negative correlation.

In predicting the binary passing indicator for juniors, conscientiousness seems to be the only valid predictor. Openness to experience seems to have some relationship to the indicator, though the *p*-value is too high to be confident. Once one outlier was removed, neuroticism seems to be similar to openness. The interaction of conscientiousness and openness appears to be the best predictor. Conscientiousness is positively correlated with the indicator, and neuroticism and openness, if valid, are negatively correlated with the indicator.

In predicting the binary passing indicator for seniors, neuroticism has an acceptable *p*-value and conscientiousness is not far behind. Their combination improves the *p*-value, and their

interaction improves it further. Neuroticism appears negatively correlated and conscientiousness appears positively correlated to the indicator.

The best result for the juniors subset, conscientiousness and openness, does not generalize to the seniors subset. However, the best result for the seniors subset, neuroticism and conscientiousness, is the second best result for the juniors subset.

In predicting the binary passing indicator, the best results from the juniors and seniors subsets, respectively, were also the top results. Though none of the variables appear valid as individual or combined predictors, the interaction of variables does produce an acceptable *p*-value. Conscientiousness with openness is the best, and conscientiousness with neuroticism is a close second. Conscientiousness appears positively correlated with the indicator, and the other two appear negatively correlated with the indicator.

Attempts to weight the binary indicator did not produce significant results when homogeneous sets were analyzed, but at least produced suggestive results about the combination of conscientiousness and neuroticism.

Attempts to examine subsets of the data based on college did not produce significant results.

A summary of these key results can be found in Appendix C.

DISCUSSION AND CONCLUSION

In predicting attempts required to pass actuarial exams, emotional stability appears to be the best predictor of success. Those who are more emotionally stable appear to pass in fewer attempts than those who are more highly neurotic or less emotionally stable. This result appears valid for Exam P, although it does not appear to generalize to Exam FM at first glance, and the low number of data points for Exam FM might cause one to question the results of that analysis. As such, it is difficult to draw a definite conclusion about Exam FM.

Interestingly, conscientiousness does not appear predictive of attempts to pass for either exam, despite numerous other studied pointing to such a relationship. Neuroticism, though not

predicted to have as strong of a relationship than conscientiousness based on prior research studies, appears to be the best in this case.

In predicting the binary passing indicator, conscientiousness and neuroticism appear to be the best predictors, as expected based on prior research studies. For juniors, conscientiousness predicts passing while neuroticism has a somewhat less valid but still suggestive relationship. The relationships for seniors appear similar to those of juniors. Neuroticism is the best, with conscientiousness close behind. The result extends to those who have seen more than half the material, though those results have similar doubts surrounding them. In sum, though, there is a respectable amount of consistency across these three subsets which is also in line with prior research.

Taken together, these results seems to indicate that a randomly selected student with higher conscientiousness and higher emotional stability is more likely to have passed than a randomly selected student with lower scores, given that the two students are similar in terms of year or amount of relevant exam material covered. Additionally, a student with higher emotional stability should take relatively fewer attempts to pass an exam than a student with lower emotional stability.

The author posits that higher emotional stability relates to better performance because a student who is more emotionally stable is less likely to have mood swings or get discouraged as easily by the difficult material required for actuarial exams. Such a student should be less likely to let negative emotions interfere with their preparation despite the difficulty they encounter along the way.

The author further posits that higher conscientiousness relates to better performance because such a student is likely to be more meticulous and diligent about studying material they are weaker in, and thus will likely have spent more time ensuring that they know the material than a person who has lower conscientiousness who may have studied the same amount of material but not to the same degree.

LIMITATIONS & SUGGESTIONS FOR FURTHER RESEARCH

The results of these analyses are interesting, but there are several limitations which bear mentioning.

Firstly, when considering the various subsets examined, it was generally true that smaller subsets produced less favorable results. The relatively small sample size appears to have an adverse effect on the results of the study. As such, it would be ideal to perform these kinds of analyses again with a larger sample to see if the results, which are already fairly good, improve further.

Another limitation is the bias in the sample used. College students were examined, but not all respondents had passed exams at the time of the study, and so potentially valuable information is missed. For example, one part of this analysis looked at how many attempts it took to pass a given exam, but out of necessity, included only those who had passed the exam. Because of this, a person who had attempted the exam and failed, but that would go on to pass on the next attempt, would not be included. As such, that particular study may be biased in favor of those who passed sooner, regardless of the number attempts it took that person to do so. Because of this, it may be beneficial to sample actuaries who are more likely to have passed the exams studied, and have them report the date of their passing, so that the sample includes a clearer picture of performance.

Additionally, it would be good to study the individual personality factors in more depth. There may be other relationships present that are not captured by a simple linear regression. Perhaps the effect of a variable is pronounced at the extreme values but not as much in the middle, or vice versa. Perhaps there is a quadratic or other higher-order relationship. Perhaps there is some interaction effect between variables that a simple multiplicative variable cannot capture. Though such in-depth examinations were beyond the scope of this study, the results obtained in this study could narrow the focus of such future analyses in an effort to obtain a clearer, more statistically valid result, which would shed further light on the underlying relationships.

Finally, once the nature of the personality-performance relationship is defined more exactly, an ideal study would be to obtain the personality scores of actuarial students before they begin exams, and to check actual performance against expected performance.

APPENDICES

Appendix A – Personality Factors as Predictors of Exam Attempts

Table A1 shows the p-values, R^2 values, error term normality ratings, and equations for the regression analyses of the five personality variables as predictors of Exam P attempts. For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed and the modified regression results marked with "mod."

Table A1: Personality Factors as Individual Predictors of Exam P Attempts

Predictors	P-value	R^2	Errors	Equation
Neuroticism (n=55)	0.193	3.2%	OK	1.324 + 0.033(N)
Neuroticism, mod. (n=53)	0.068	6.4%	OK	0.969 + 0.055(N)
Extraversion (n=55)	0.891	0.0%	Bad	1.840 + 0.004(E)
Openness (n=55)	0.401	1.3%	OK	2.835 – 0.030(O)
Openness, mod. (n=53)	0.638	0.4%	OK	2.540 – 0.019(O)
Agreeableness (n=55)	0.537	0.7%	Bad	1.372 + 0.019(A)
Agreeableness (n=54)	0.513	0.8%	Bad	1.288 + 0.021(A)
Conscientiousness (n=55)	0.780	0.1%	Bad	1.685 + 0.008(C)
Conscientiousness, mod. (n=54)	0.390	1.4%	Bad	1.005 + 0.026(C)

Table A2 shows the p-values, R^2 values, error term normality ratings, and equations for the regression analyses of several combinations of the five personality variables as predictors of Exam P attempts. These combinations were chosen as the top combinations of variables by the best subsets analysis within the software package. Personality factors are referred to by their first letter only in the Predictors column.

For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed and the modified regression results marked with "mod."

Table A2: Personality Factors as Combined Predictors of Exam P Attempts

Predictors	P-value	R^2	Error	Equation
N and A (n=55)	0.222	5.6%	OK	-0.046 + 0.044(N) + 0.037(A)
N and A, mod. (n=54)	0.108	8.4%	OK	-0.347 + 0.061(N) + 0.038(A)
N and O (n=55)	0.275	4.8%	OK	2.266 + 0.035(N) – 0.034(O)
N and O, mod. (n=54)	0.188	6.3%	OK	1.669 + 0.048(N) – 0.021(O)
N, O, and A (n=55)	0.236	7.9%	Bad	0.890 + 0.048(N) – 0.040(O) + 0.042(A)
N, O, and A, mod. (n=54)	0.177	9.3%	Bad	0.341 + 0.060(N) – 0.027(O) + 0.041(A)

Table A3 shows the p-value, R^2 value, error term normality ratings, and equation for the regression analyses of an interaction variable consisting of neuroticism and agreeableness as a predictor of Exam P attempts. This pair was chosen because they both appeared to have some relationship to attempts when together, as illustrated in Table A2, and had a significant degree of correlation.

Table A3: Interaction of Personality Factors as Predictors of Exam P Attempts

Predictors	P-value	R^2	Error	Equation
Interaction: N and A (n=55)	0.034	8.2%	OK	0.893 + 0.0018(NA)

Table A4 shows the p-values, R^2 values, error term normality ratings, and equations for the regression analyses of the five personality variables as predictors of Exam FM attempts. No trials had any high leverage data points.

Table A4: Personality Factors as Individual Predictors of Exam FM Attempts

Predictors	P-value	R^2	Error	Equation
Neuroticism (n=29)	0.158	7.2%	OK	1.812 – 0.026(N)
Extraversion (n=29)	0.615	1.0%	Bad	1.729 – 0.013(E)
Openness (n=29)	0.354	3.2%	Bad	2.071 – 0.025(O)
Agreeableness (n=29)	0.121	8.7%	OK	0.309 + 0.034(A)
Conscientiousness (n=29)	0.985	0.0%	Bad	1.360 – 0.0004(C)

Table A5 shows the p-values, R^2 values, error term normality ratings, and equations for the regression analyses of several combinations of the five personality variables as predictors of Exam FM attempts. These combinations were chosen as the top combinations of variables by the best subsets analysis within the software package. Personality factors are referred to by their first letter only in the Predictors column.

Table A5: Personality Factors as Combined Predictors of Exam FM Attempts

Predictors	P-value	R^2	Error	Equation
O and A (n=29)	0.076	18.0%	OK	1.22 – 0.046(O) + 0.048(A)
N and E (n=29)	0.142	13.9%	OK	3.219 – 0.040(N) – 0.038(E)
E, O, and A (n=29)	0.119	20.5%	Bad	1.597 – 0.023(E) – 0.041(O) + 0.054(A)
N, E, O, and A (n=29)	0.149	23.7%	Bad	2.50 – 0.034(E) – 0.034(O) + 0.042(A) – 0.022(N)

Table A6 shows the p-values, R^2 values, error term normality ratings, and equations for the regression analyses of several combinations of the five personality variables as interaction variable predictors of Exam P attempts. These pairs were chosen because they appeared to have some relationship to attempts, as illustrated in Tables A4 and A5, and also had some significant degree of correlation between them. For variables where the correlation with attempts seemed to be negative, the value was reversed by subtracting from the maximum value of 48, thus changing the negative correlation to positive. This was primarily done so that the effects of the two variables involved would compound rather than cancel when multiplied.

Table A6: Interaction of Personality Factors as Predictors of Exam FM Attempts

Predictors	P-value	R^2	Error	Equation
Interaction: N_r and A (n=29)	0.065	12.0%	OK	$0.650 + 0.0007(N_rA)$
Interaction: N_r and E_r (n=29)	0.051	13.4%	Bad	$0.543 + 0.0016(N_rE_r)$
Interaction: E_r and A (n=29)	0.092	10.2%	Bad	$0.647 + 0.0014(E_rA)$
Interaction: O_r and A (n=29)	0.023	17.8%	OK	$0.222 + 0.0020(O_rA)$

Appendix B – Personality Factors as Predictors of General Passing Efficiency

Table B1 shows the p-values, R^2 values, error term normality ratings, and equations for the regression analyses of the five personality variables as predictors of a binary passing indicator representing the passing of at least one exam or neither. These results used a subset of the full dataset containing only juniors.

For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed. If the results showed improvement over the unmodified results, they were included and marked with "mod."

Table B1: Personality Factors as Individual Predictors of Juniors' Exam Efficiency

Predictors	P-value	R^2	Equation
Neuroticism (n=46)	0.441	1.4%	0.631 – 0.0085(N)
Neuroticism, mod. (n=45)	0.129	5.3%	0.825 – 0.019(N)
Extraversion (n=46)	0.806	0.1%	0.378 + 0.0025(E)
Openness (n=46)	0.168	4.3%	1.021 – 0.018(O)
Agreeableness (n=46)	0.649	0.5%	0.268 + 0.0057(A)
Conscientiousness (n=46)	0.085	6.6%	-0.283 + 0.022(C)

Table B2 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of select combinations of variables as predictors of the binary passing indicator, as chosen by a best subsets analysis. These results used a subset of the full dataset containing only juniors. Personality factors are referred to by their first letter only in the Predictors column.

For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed. None of the results showed improvement over the unmodified results, and so were not included.

Table B2: Combinations of Personality Factors as Predictors of Juniors' Exam Efficiency

Predictors	P-value	R^2	Equation
C and O (n=46)	0.079	11.1%	0.284 + 0.022(C) – 0.019(O)
C and N (n=46)	0.227	6.7%	-0.202 + 0.021(C) – 0.002(N)
C, E, and O (n=46)	0.157	11.5%	0.182 + 0.022(C) + 0.004(E) – 0.019(O)
C, E, O, and N (n=46)	0.257	11.9%	0.032 + 0.024(C) + 0.006(E) – 0.022(O) + 0.005(N)

Table B3 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of several combinations of the five personality variables as interaction variable predictors of the binary passing indicator. These pairs were chosen because they appeared to have some relationship to passing, as illustrated in Tables B1 and B2, and also had some significant degree of correlation between them. For variables where the correlation with attempts seemed to be negative, the value was reversed by subtracting from the maximum value of 48, thus changing the negative correlation to positive. This was primarily done so that the effects of the two variables involved would compound rather than cancel when multiplied.

The interaction of conscientiousness and openness to experience was added despite a near-zero correlation because the results in table B2 suggest some joint predictive ability.

Table B3: Interaction of Personality Factors as Predictors of Juniors' Exam Efficiency

Predictors	P-value	R^2	Equation
Interaction: N_r and O_r (n=46)	0.138	4.9%	$0.208 + 0.0005(N_rO_r)$
Interaction: N_r and A (n=46)	0.379	1.8%	$0.252 + 0.0002(N_rA)$
Interaction: N_r and C(n=46)	0.139	4.9%	$0.129 + 0.0003(N_rC)$
Interaction: A and C (n=46)	0.111	5.7%	$0.033 + 0.0004(AC)$
Interaction: C and O_r (n=46)	0.035	9.7%	$0.039 + 0.0007(CO_r)$

Table B4 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of the five personality variables as predictors of a binary passing indicator representing the passing of at least one exam or neither. These results used a subset of the full dataset containing only seniors.

For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed. None of the results showed improvement over the unmodified results, and so were not included.

Table B4: Personality Factors as Individual Predictors of Seniors' Exam Efficiency

Predictors	P-value	R^2	Equation
Neuroticism (n=54)	0.095	5.3%	0.900 – 0.013(N)
Extraversion (n=54)	0.667	0.4%	0.521 + 0.004(E)
Openness (n=54)	0.990	0.0%	0.626 + 0.0001(O)
Agreeableness (n=54)	0.875	0.0%	0.628 – 0.002(A)
Conscientiousness (n=54)	0.139	4.2%	0.227 + 0.012(C)

Table B5 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of select combinations of variables as predictors of the binary passing indicator, as chosen by a best subsets analysis. These results used a subset of the full dataset containing only seniors. Personality factors are referred to by their first letter only in the Predictors column.

For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed. None of the results showed improvement over the unmodified results, and so were not included.

Table B5: Combinations of Personality Factors as Predictors of Seniors' Exam Efficiency

Predictors	P-value	R^2	Equation
N and C (n=54)	0.115	8.1%	0.530 – 0.012(N) + 0.010(C)
N and A (n=54)	0.142	7.4%	1.377 – 0.018(N) – 0.013(A)
N, A, and C (n=54)	0.111	11.2%	1.052 – 0.017(N) – 0.016(A) + 0.012(C)
N, O, A, and C (n=54)	0.202	11.2%	1.070 – 0.017(N) – 0.0006(O) – 0.016(A) + 0.012(C)

Table B6 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of several combinations of the five personality variables as interaction variable predictors of the binary passing indicator. These pairs were chosen because they appeared to have some relationship to passing, as illustrated in Tables B4 and B5, and also had some significant degree of correlation between them. For variables where the correlation with attempts seemed to be negative, the value was reversed by subtracting from the maximum value of 48, thus changing the negative correlation to positive. This was primarily done so that the effects of the two variables involved would compound rather than cancel when multiplied.

The interaction of conscientiousness and neuroticism was added despite a statistically insignificant correlation because the results in table B2 suggest some joint predictive ability.

Table B6: Interaction of Personality Factors as Predictors of Seniors' Exam Efficiency

Predictors	**P-value**	**R^2**	**Equation**
Interaction: N_r and A_r (n=54)	0.087	5.5%	$0.322 + 0.0007(N_rA_r)$
Interaction: N_r and C (n=54)	0.047	7.4%	$0.308 + 0.0004(N_rC)$
Interaction: A_r and C (n=54)	0.265	2.4%	$0.444 + 0.0003(A_rC)$

Table B7 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of the five personality variables as predictors of a binary passing indicator representing the passing of at least one exam or neither. These results used a subset of the full dataset containing only those who had attempted Exam P and studied at least half of the material in total before attempting it.

For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed. If the results showed improvement over the unmodified results, they were included and marked with "mod."

Table B7: Personality Factors as Individual Predictors of Exam Efficiency, Given >50% Material Studied in Total

Predictors	P-value	R^2	Equation
Neuroticism (n=78)	0.181	2.3%	0.826 – 0.010(N)
Neuroticism, mod. (n=76)	0.182	2.4%	0.849 – 0.011(N)
Extraversion (n=78)	0.630	0.3%	0.756 – 0.004(E)
Extraversion, mod. (n=77)	0.337	1.2%	0.892 – 0.008(E)
Openness (n=78)	0.184	2.3%	0.998 – 0.012(O)
Agreeableness (n=78)	0.739	0.1%	0.549 + 0.003(A)
Conscientiousness (n=78)	0.176	2.4%	0.253 + 0.114(C)

Table B8 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of select combinations of the five personality variables as predictors of a binary indicator representing the passing of at least one exam or neither. These results used a subset of the full dataset containing only those who had attempted Exam P and studied at least half of the material in total before attempting it. Personality factors are referred to by their first letter only in the Predictors column.

For some trials, certain data points had high leverage, meaning they could be distorting the results because of their extreme values. In these cases, the high-leverage data points were removed. None of the results showed improvement over the unmodified results, and so were not included.

Table B8: Combinations of Personality Factors as Predictors of Exam Efficiency, Given >50% Material Studied in Total

Predictors	P-value	R^2	Equation
C and O (n=78)	0.163	4.7%	0.600 + 0.115(C) – 0.012(O)
C and N (n=78)	0.195	4.3%	0.457 + 0.010(C) – 0.009(N)
N, O, and C (n=78)	0.203	6.0%	0.727 – 0.007(N) – 0.010(O) + 0.011(C)
N, E, O, and C (n=78)	0.274	6.7%	0.861 – 0.009(N) – 0.006(E) – 0.008(O) + 0.012(C)

Table B9 shows the p-values, R^2 values, Durbin-Watson statistics, and equations for the regression analyses of several combinations of the five personality variables as interaction variable predictors of the binary passing indicator. These pairs were chosen because the individual variables appeared to have some relationship to passing, as illustrated in Tables B7 and B8, despite statistically insignificant correlation between the variables. For variables where the correlation with passing seemed to be negative, the value was reversed by subtracting from the maximum value of 48, thus changing the negative correlation to positive. This was primarily done so that the effects of the two variables involved would compound rather than cancel when multiplied.

Table B9: Interaction of Personality Factors as Predictors of Exam Efficiency, Given >50% Material Studied in Total

Predictors	**P-value**	**R^2**	**Equation**
Interaction: N_r and O_r (n=78)	0.125	3.1%	$0.452 + 0.0004(N_rO_r)$
Interaction: N_r and C (n=78)	0.071	4.2%	$0.359 + 0.0003(N_rC)$
Interaction: O_r and C (n=78)	0.058	4.6%	$0.376 + 0.0004(O_rC)$

Appendix C – Key Findings Summary

Tables C1 and C2 summarize the most significant single variables and combinations of variables from all regression analyses.

Table C1: Summary of Significant Single Predictors

Y Variable Predicted	n*	Best X	P-val	Second Best X	P-val	Corr. with Y
P attempts	55	N	0.068	--	--	N +
FM attempts	29	A	0.121	N	0.158	A + / N -
0-1 (Pass) for Juniors	46	C	0.085	N	0.129	C + / O -
0-1 (Pass) for Seniors	54	N	0.095	C	0.139	C + / N -
0-1 (Pass) for >50% material	78	--	--	--	--	--

*Ignores deleted outliers

Table C2: Summary of Significant Combinations of Predictors

Y Variable Predicted	n	Best Xs	P-val	Corr. with Y
P attempts	55	Int(N, A)	0.034	N + / A +
FM attempts	29	Int(O, A)	0.023	O - / A +
0-1 (Pass) for Juniors	46	Int(C, O)	0.035	C + / O -
0-1 (Pass) for Seniors	54	Int(N, C)	0.047	N - / C +
0-1 (Pass) for >50% material	78	Int(O, C)	0.058	O - / C +

Appendix D – Survey and Consent Form

The following three pages contain the survey and consent form given out for this study. The NEO-FFI-3 was also administered at the same time.

A Multiple Regression Analysis of
Personality's Impact on Actuarial Exam Performance

Please do not put your name on this survey. Your responses should be anonymous. You should sign and date the consent form indicating your consent to participate before completing this survey; that consent form will be stored separately from this survey to ensure your anonymity. You have the right to withdraw participation at any time if you feel uncomfortable answering any of the following questions. Thank you for your participation.

General Questions

1. Please indicate your gender: □ Male □ Female

2. Please indicate your year in college: □ Junior □ Senior

3. Please indicate your GPA on a 4.0 scale (if you do not know, please estimate): _____

Actuarial Exam 1/P Questions

4. Have you attempted Actuarial Exam 1/P? □ Yes □ No
   (If you answer No, you may skip questions 5 – 7 and proceed to question 8)

5. How many times have you attempted Actuarial Exam 1/P? _____
   Have you passed? □ Yes □ No

6. How much of the material for Actuarial Exam 1/P had you studied **in college classes:**
   Before sitting for your first attempt: □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%
   When you passed: □ not passed □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%

7. How much of the material for Actuarial Exam 1/P had you studied **in total:**
   Before sitting for your first attempt: □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%
   When you passed: □ not passed □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%

Actuarial Exam 2/FM Questions

8. Have you attempted Actuarial Exam 2/FM? □ Yes □ No
   (If you answer No, you may skip questions 9 – 11 and proceed to the personality survey)

9. How many times have you attempted Actuarial Exam 2/FM? _____
   Have you passed? □ Yes □ No

10. How much of the material for Actuarial Exam 2/FM had you studied **in college classes:**
    Before sitting for your first attempt: □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%
    When you passed: □ not passed □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%

11. How much of the material for Actuarial Exam 2/FM had you studied **in total:**
    Before sitting for your first attempt: □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%
    When you passed: □ not passed □ 0 – 25% □ 25 – 50% □ 50 – 75% □ 75 – 100%

RESEARCH PARTICIPANT CONSENT FORM

1. Statement of purpose

You are invited to participate in a study of *A Multiple Regression Analysis of Personality's Impact on Actuarial Exam Performance*. We hope to learn more about a potential link between personality and actuarial exam performance. You were selected as a possible participant in this study because you are an actuarial mathematics major who is working towards passing actuarial exams.

2. Description, Including Risks and Benefits

If you decide to participate, we will conduct an experiment involving the following procedures: You will take a survey that will measure certain dimensions of your personality and collect certain information about your actuarial exam progress. This should take no more than 20 minutes at most. There are no expected risks to you as a participant.

The data to be collected constitute potentially sensitive information. However, care will be taken to ensure that it remains anonymous (see section 3, Confidentiality). Also, you may withdraw from participating in the study at any time if at any time you feel uncomfortable divulging any information.

3. Confidentiality

Any information obtained in connection with this study will remain confidential and will not be disclosed to the general public in a way that can be traced to you. In any written reports or publications, no participant other than the researchers will be identified, and only anonymous data will be presented. If the raw data is released to any other persons or agencies for any reason, only anonymous data will be furnished.

This consent form, with your signature, will be stored separately and independently from the data collected so that your responses will not be identifiable.

4. Statement that Participation Is Voluntary

Your participation is totally voluntary, and your decision whether or not to participate will not affect your future relations with Bryant University or its employees in any way. If you decide to participate, you are also free to discontinue participation at any time without affecting such relationships. However, it is requested that you notify the investigator of this.

5. Persons to Contact

If you have any questions, we will be happy to answer them; contact information is provided below. You can have a copy of this form to keep if you so wish.

Matt Ciaffone (principal investigator)	401-319-7495	mciaffon@bryant.edu.
Jim Bishop (research advisor)	401-232-6356	jabishop@bryant.edu
Tony Houston	401-232-6816	thouston@bryant.edu
(Bryant Institutional Review Board contact)		

6. Signature Indicating Informed Consent

Please sign below if you have decided to participate. Your signature indicates only that you are at least 18 years of age and have read the information provided above. Your signature does not obligate you to participate, and you may withdraw from the study at any time without consequences.

Signature of Participant	**Date**
Signature of Principal Investigator	**Date**

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