

Conscientiousness as a Mediator of Caffeine Use and Academic Performance

The Honors Program
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Student's Name: Laura Lussier
Faculty Sponsor: Joseph Trunzo
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ABSTRACT

Academic performance (AP) is of primary importance to undergraduate students because it is related to future economic and occupational success. Therefore, it is not surprising that students want to maximize their GPA, a common measure of AP. This study used a survey model to investigate the relationships among caffeine use (CU), conscientiousness (CN), and AP. Specifically, it was hypothesized that there would be a positive correlation between CU and GPA, CU and CN, and CN and GPA. In addition, CN was believed to be a mediating variable in the CU-GPA relationship. Analysis of the results revealed that the only significant relationship was the positive correlation between CN and GPA. Additional analyses were performed investigating CU and time-consuming activities. These variables were successfully entered into a model to predict AP. Upon entering CN into this relationship, many of the variables were reduced to nonsignificance. Therefore, students who are low on CN must pay attention to how they spend their time if they want to do well academically because time management may not come naturally to them. Future research should consider using more direct measures and a larger sample size in an attempt to investigate the relationships between the variables.

INTRODUCTION

Academic performance (AP) is highly important to many students. It is a good measure of intelligence and problem solving abilities (Poropat, 2009). Positive AP in undergraduate studies is also correlated with future occupational and economic success (Poropat, 2009). Therefore, it is not surprising that people who are enrolled in undergraduate degree programs desire to maximize their grade point average (GPA), a common measure of AP.

Students who are beginning their undergraduate degree programs often find it difficult to manage their time and thus reduce the amount of sleep they receive each night. In order to remain awake, they turn to caffeine as a quick source of energy. This drug allows students to focus on an exam for which they stayed up all night studying or to focus during any information encoding, such as reading or listening to lectures. The popularity of caffeinated drinks has exploded over the past decade, with over 500 new energy drinks hitting the market in 2006 alone (Lord, 2007). In that same year, the industry, estimated at \$3.4 billion per year, grew by 80% (Lord, 2007). The number of consumers nearly doubled to 7.6 million within three years (Lord, 2007). Despite its perceived benefits to AP, significant caffeine use can lead to addiction and contribute to negative health effects. Consumers do not appear to be concerned: Lord's research reveals that energy drinks are "a much more mainstream beverage...that's used to give people a jolt of energy" (2007).

AP is affected by a multitude of factors, both internal and external. External factors are primarily sociocultural and ecological in nature, for example, family, school environment, and culture. Parents, professors, and peers can have an especially significant impact on AP. In particular, students who come from a family with low socioeconomic status, who are raised by a single parent, who have step-parents, and who are not very involved with their family will, on average, experience a different level of AP than those students who do not have these factors. Additionally, the number of friends students have as well as their friends' attitudes can impact their performance in classes. School factors, such as its size, climate, the availability of counseling, and attitudes of the professors, can also play a large role in the way students perform. Internal factors, which can be controlled and manipulated by the student, include achievement motivation, academic self-concept, and his or her beliefs about effort and

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ability. The latter is known more specifically as the locus of control. In addition, self efficacy, the judgment of whether one can perform vital actions to achieve a specific outcome, plays a large role in students' ultimate AP (Chen, 2005; Klomegah, 2007).

The Goal-Efficacy Framework is a theoretical model which clearly summarizes the effect that various factors can have on students' AP. The four primary factors are: self-set goals, assigned goals, self efficacy, and aptitude/ability. Aptitude and ability can affect AP both directly and indirectly. Directly, it determines the degree of effort put forth in assignments as well as the ability to persist with difficult assignments. Indirectly, it influences the level of self-efficacy and personal goals. Students must believe that they can achieve in order to unlock their full potential. In other words, self efficacy is necessary to give students the confidence to use their prior knowledge and experiences and apply them to the task at hand, thus allowing them to achieve better AP. Self-set goals directly affect AP by motivating students to put their talents into action. They also determine which tasks and learning strategies will effectively improve AP. Assigned goals, generally given by professors, work indirectly because students do not often live up to their professors' lofty goals. The research conducted by Klomegah (2007) verified that this framework is useful in predicting AP. Klomegah also found that self efficacy was the strongest predictor in the model. Therefore, psychological factors can have a very strong effect on undergraduate AP and an awareness of this can result in better AP for students (Klomegah, 2007).

Another psychological factor which can influence AP is personality. A widely accepted model of personality is known as the Five Factor Model. It is comprised of the dimensions Agreeableness (friendliness), Conscientiousness (need to achieve), Neuroticism (adjustment/anxiety), Extraversion (sociability), and Openness (imaginativeness). More orderly than previous explanations, this model explains most of the variance in personality in a few elements. Openness, Agreeableness, and Conscientiousness each have at least a small relationship ($0.14 < d < 0.46$) with AP (Poropat, 2009). However, the literature proves on several occasions that conscientiousness has the strongest positive correlation with AP out of the five dimensions (Poropat, 2009; Trapmann et al, 2007; Nofle & Robins, 2007).

LITERATURE REVIEW

Academic Performance & Conscientiousness

Conscientiousness (CN) is characterized by competence, order, dutifulness, achievement striving, self-discipline, and deliberation. It is not surprising that students with these traits have positive AP. This personality trait has been found to predict course grades, objective test performance, and early completion of independent work (Dollinger & Orf, 1991).

CN is related to sustained effort, goal setting, concentration on homework, and time management (Poropat, 2009). Each of these variables, when managed effectively, produces better grades. The meta-analysis conducted by Poropat (2009) found a medium-sized relationship of $d = 0.46$ between CN and AP. This means that students who are not very conscientious are about twice as likely to fail in an academic setting. Surprisingly, this personality factor has a stronger relationship with achievement than SAT scores (Nofle & Robins, 2007) and is as important as intelligence in predicting final grades (Poropat, 2009). In particular, the facets of achievement striving, perseverance, and self-control were the most important in high school and college success (Nofle & Robins, 2007).

CN becomes increasingly important as students continue in their educational careers. The correlations between the other personality factors in the five factor model and academic performance declined as students moved from primary to secondary and primary to tertiary education. However, this effect was not true for CN (Poropat, 2009). In addition, moderator analyses were not able to reduce the relationship between CN and AP to nonsignificance. Therefore, CN is an important part of AP without regard to major, culture, age, gender, and SAT scores (Nofle & Robins, 2007; Trapmann, 2007). In fact, the findings are so robust that Trapmann et al (2007) propose using a personality test in the college application process in order to determine which students will truly succeed in university.

Conscientiousness & Health Behaviors

CN has also been linked to positive health behaviors. It can affect health through social environmental factors and health-related behaviors. Social environmental factors include career success, marital stability, religiosity, and healthier life paths. These factors generally have an indirect effect on a person's health. However, CN has also been found to have a

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direct link to health. Conscientious individuals are able to control their impulses; therefore, they are less likely to consume alcohol and drugs. In addition, conscientious people are more likely to take part in preventative and accident control behaviors, such as seeing a doctor regularly and ensuring that household smoke detectors are functional (Roberts, Walton, & Bogg, 2005).

The results of several studies have proven that there is a negative relationship between CN and poor health behaviors (Roberts, Walton, & Bogg, 2005; Bogg & Roberts, 2004). Correlations between CN and risky health behaviors, such as inactivity, risky sex, unhealthy eating, tobacco use, excessive alcohol use, and drug use, ranged between $r = -0.05$ and $r = -0.28$ (Roberts, Walton, & Bogg, 2005). Drug use had the strongest relationship, and the various components of this variable were considered. The results reveal the following correlations: $r = -0.33$ for marijuana use, $r = -0.24$ for polysubstance use, and $r = -0.22$ for opiate/heroin use (Bogg & Roberts, 2004). Additionally, there are some aspects of CN that are more important in predicting health outcomes than are others. Specifically, social responsibility at age 21 predicted the negative correlation with tobacco and marijuana use 20 to 30 years later (Bogg & Roberts, 2004).

Moreover, studies found that positive health behaviors increased a person's level of CN (Roberts, Walton, & Bogg, 2005; Bogg & Roberts, 2004). This creates a perpetual cycle which increases levels of CN throughout the life span. Reducing drug use and excessive alcohol consumption can increase CN, which in turn decreases the amount of drugs and alcohol consumed.

In general, conscientious individuals tend to avoid potentially harmful behaviors, such as drug use, and they tend to participate in activities related to positive health outcomes. Therefore, one would believe that conscientious individuals will not consume caffeine because it is a drug. However, caffeine is a socially accepted, generally innocuous drug; therefore conscientious individuals may not view it as a threat to their health. Instead, they view it as an energy source that can help them achieve their goals. It is important to study the relationship between CN and CU given the American population's increase in caffeine consumption in recent years (Julien, 2005).

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Caffeine Use

Caffeine is the most popular drug worldwide (Rogers, 2007). About 80% of the adult population in the US consume it daily in products such as coffee, tea, soda, chocolate, ice cream, and over-the-counter medications (Julien, 2005). It is rapidly distributed throughout the body after consumption and reaches its peak concentration after 30-40 minutes (Rogers, 2007). Caffeine forms a blockade of the adenosine receptor. Adenosine is involved in sleep and wakefulness; it acts as a sedative and a depressant. Therefore, using the blockade, caffeine is able to affect alertness and performance on tasks requiring sustained attention. It takes about 3-6 hours for adults to remove half of the caffeine consumed from their bodies (Rogers, 2007).

In smaller doses, caffeine consumers will experience increased mental alertness, a faster and clearer flow of thought, and reduction of fatigue. These effects comprise the primary reasons consumers are so attracted to this drug. The “increased mental awareness results in sustained intellectual effort for prolonged periods of time without significant disruption of coordinated intellectual or motor activity” (Julien, 2005).

Despite its positive attributes, caffeine consumption has several drawbacks. Consumers can experience jitteriness, heightened anxiety, rapid breathing, and insomnia. Frequent users develop a slight tolerance and therefore need continuously higher doses to achieve the same results. Discontinuing consumption can lead to withdrawal symptoms, such as headache, drowsiness, and poor mood.

Caffeine Use & Academic Performance

Caffeine is well-known for increasing alertness and studies have shown that it also increases cognitive performance. Respondents who consumed caffeine answered faster than those who did not on various cognitive tests. Researchers found that 200 mg of caffeine, the amount found in about two 5 oz. cups of coffee, improved subjects’ performance on both simple and complex tasks as well as improved subjective feelings of wakefulness (Kohler et al, 2006).

The primary reason for which students consume caffeine is because they have found that “caffeine improves performance of tasks involving sustained encoding of new information even when the alertness level of the person is high” (Hewlett & Smith, 2007). This is

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extremely beneficial when students are studying for upcoming examinations (Hewlett & Smith, 2007).

Sleep deprivation is known to effect cognitive processes. A meta-analysis conducted by Ruxton (2008) examined seven studies with sleep-deprived subjects, in which only three showed that caffeine restored some of the cognitive functions. Therefore, caffeine cannot make up for the loss of benefits due to less-than-optimal sleep. Ruxton also found that habitual caffeine users experienced greater cognitive effects than infrequent or non-users. These effects were also found when the expectation is removed. Therefore, the frequent consumers do not build a complete tolerance of the drug but they may require more caffeine to experience the same effects and thus become dependent on it (Ruxton, 2008).

In summary, the effects that caffeine has on regulation of alertness can help students prepare for exams. If a student must perform well with less than optimal sleep, a cup of coffee or an energy drink may help him or her stay awake to study or take the exam. In addition, caffeine's positive effects on cognitive processes will help the student master the material more easily. Both of these effects will produce better AP.

Conscientiousness, Caffeine Use, & Academic Performance

The study conducted by Musgrave-Marquart, Bromley, and Dalley (1997) is most similar to the present study. They found that GPA was positively related to CN and negatively related to alcohol consumption and nicotine use. CU did not have a significant correlation with GPA. However, this study was conducted over a decade ago and the nature of caffeine consumption has changed dramatically. Several caffeinated products have been developed since this study, and college students are now more likely to consume these products in larger quantities. Therefore, the relationship currently has the potential to be significant. Their analyses showed that CN was able to account for 10% of the variance in GPA. Ultimately, CN and lack of nicotine use were among the best predictors of positive AP. The researchers discussed the possibility that conscientious students are able to perform well in college because they are well-organized, purposeful, and persistent.

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Hypotheses

The first hypothesis is that there will be a positive correlation between CU and AP. Past research has shown that caffeine has a positive effect on cognitive functions and AP is closely related to cognitive abilities. The second hypothesis is that there will be a positive relationship between CU and CN. Although the research showed that CN is negatively related to drug use, caffeine is not typically viewed as a harmful stimulant so conscientious individuals may not be wary of it. The third hypothesis is that there will be a positive relationship between CN and AP based on the large amount of research confirming this relationship.

The final hypothesis is that CN will act as a mediating variable in this study. Although students may believe that they perform well academically due to their caffeine intake, it can be argued that their conscientious personalities are brought out by their caffeine consumption and this is the true driver of positive AP. Therefore, the relationship between CU and AP will no longer be significant once the variable CN is introduced into the model.

METHODOLOGY

Participants

The participants in this study were undergraduate students at Bryant University. This convenience sample was chosen because students have several measures of AP readily available. Participants were recruited to take an online survey through email. Those who were asked by their Psychology professors may have received extra credit in the class.

Originally, 172 participants were recruited to participate in the study. However, 23 did not complete the survey, resulting in 149 valid participants. The sample contained 50 male and 99 female subjects. Ages ranged from 18-45 years with an average age of 20.28 years. The sample was predominantly white (89%).

Measures

Demographics: The demographics section was adapted from the form used by the US Census. The survey also inquired about academic factors, such as major, year in school, learning disabilities, and psychological disabilities. Additional factors were also added to gain a better

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sense of the population. These include current housing, parents' educational attainment, relationship status, and employment status.

GPA: This measure was chosen to measure AP. Participants were asked to provide their current GPA to the hundredths place. Some may not consider this to be a useful measure because of grade inflation and its restricted range. This is a good measure of undergraduate AP because it incorporates many grades for a variety of different classes across one to three years. The internal reliability and validity of GPA is relatively good (Poropat, 2009).

NEO-FFI: This short survey was included to measure the big five personality traits. Participants were instructed to read each of the 60 statements and determine how well each applied to their personality. The responses available were: strongly agree, agree, neutral, disagree, and strongly disagree. The NEO-FFI scales show correlations of .75 to .89 with the NEO-PI validimax factors. Internal consistency values range from .74 to .89 (SIGMA Assessment Systems, 2007).

Substance Use: A substance use survey was given to determine relative levels of caffeine consumption. It is extremely difficult to measure exactly how much caffeine a person has consumed without administering it to them directly. This survey listed several drugs and asked participants how many days in the past month they have consumed the drug in question. Therefore, the frequency of consumption can be determined. This measure was used in previous studies (Trunzo, in progress).

RESULTS

The answers provided on the NEO FFI were coded and scored according to the directions given on the measure. A measure of total CU was calculated using information gathered on the substance use survey. The energy drink, coffee, tea, and soda items were summed to determine a total CU score. A similar method was used to determine total stimulant use and total depressant use in order to use these as controls in the analyses.

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GPA scores fell between 2.00 and 3.98, with an average of 3.25. CN scores ranged from 16 to 47 and the average level of CN was 33.71. CU scores fell between 4 and 23 with an average of 13.06.

To test the first hypothesis, CU and AP scores were entered into a correlation model. The results were not significant ($N = 149$, $p = 0.282$). To test the second hypothesis, CU and CN scores were entered into a correlation model. Again, the relationship was not significant ($N = 149$, $p = 0.715$). To test the third hypothesis, CN and AP scores were entered into a correlation model. The variables are significantly related ($N = 149$, $p = 0.000$), with $r = 0.485$. Finally, to test the fourth hypothesis, a partial correlation was used. CU and AP scores were entered into the model and CN scores were controlled. The relationship was not significant ($N = 149$, $p = 0.306$). See Appendix A for a summary of this information.

Several mediator analyses were conducted in an attempt to obtain significant relationships between all variables. The relationship between CU and CN remained nonsignificant, despite any controlling factors entered into the model. The CN and AP relationship remained significant and positive throughout each of the mediating models. The relationship between CU and AP was only significant when controlling for time-consuming activities.

The variables from the best mediator analysis were entered into a multiple regression model. The model considered time-consuming activities as well as CU in its prediction of AP. Specifically, the number of clubs (Clubs), the number of hours per week spent involved in clubs (ClubHours), CU, and employment were entered to predict GPA, the measure of AP. The model was significant ($N = 149$, $F = 7.320$, $p = 0.000$). In addition, all of the predictor variables contributed significantly to GPA ($p < 0.05$). R^2 was equal to 16.9% and R^2 adjusted was equal to 14.6%. Another model was run, similar to the previous one but with CN as an additional predictor. The model was significant ($N = 149$, $F = 13.820$, $p = 0.000$). However, many of the predictor variables were reduced to nonsignificance, including CU, ClubHours, and employment ($p > 0.05$). Only Clubs and CN remained significant ($p = 0.000$). R^2 for this model doubled to 32.6% and R^2 adjusted more than doubled to 30.2%. See Appendices B and C to compare the two regression models.

DISCUSSION

The analyses revealed that the CU-CN and CU-AP relationships were not significant. The CN-AP relationship was positive and significant, which supports the multitude of research investigating this topic. Also, because all of the relationships were not positive and significant to begin with, the mediating variable model was not significant. Moreover, CU and other time-consuming activities were found to significantly predict AP. These activities include the number of clubs a student is involved in, how much time the student dedicates to these clubs, and employment. When CN was also entered as a predictor, many of the other variables were no longer significant in the model. Therefore, the relationship between AP and CN is more robust than the relationship between AP and time-consuming activities. In addition, the model that uses CN as a predictor is better able to explain the variance found in GPA.

Although this research did not reveal a significant relationship between CU and CN, more research must be conducted before this relationship can be dismissed. Past research indicates that conscientious individuals engage in positive health behaviors (Bogg & Roberts, 2004; Roberts, Walton, & Bogg, 2005). Therefore, they are more likely to get the proper amount of sleep every night, reducing the need for caffeine in the morning. Past research has also shown negative relationships between CN and poor health behaviors. Those with high CN may not be fully aware of the negative health effects of caffeine. Caffeine is a drug, but it is a socially acceptable, innocuous drug. This theory is supported by the current research because those with high levels of CN were not more or less likely to consume caffeine. As a result, CN people, including students, have the potential to consume caffeine.

Additionally, more research must be conducted to investigate the relationship between CU and AP. Students are generally very concerned with their performance in their undergraduate studies because it will affect their ability to get into a graduate studies program or their ability to obtain a full-time job. Therefore, any variable that can affect their performance should be thoroughly examined. Caffeine is well known for increasing alertness, which is very important for students who stay up late and lose sleep in order to study. Past research has also indicated that it increases cognitive performance and aids in tasks involving prolonged

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periods of encoding new information (Hewlett & Smith, 2007; Kohler et al, 2006). These factors are extremely important in an undergraduate degree program. Students require cognitive effort and encode new information daily during class, while studying, and when solving problems.

The positive correlation between CN and AP was significant and the relationship was able to withstand a multitude of moderators. Past research agrees with this finding (Noftle & Robins, 2007; Poropat, 2009; Trapmann, 2007). Therefore, there is a strong relationship between these two variables. Conscientious students are able to sustain their effort towards their studies, concentrate on homework, and manage their time effectively (Poropat, 2009). These efforts clearly lead to a better understanding of the material and thus better AP. Students who do not have high levels of CN naturally can learn to adopt the characteristics of conscientious students in order to improve their grades.

It is important that the CN-AP relationship was significant and in the expected direction. This validates the measures used in this study. GPA is a good measure of AP despite its lack of range because it encompasses many different measures of AP (exams, homework assignments, and projects) in several subject areas at the undergraduate level. The NEO FFI is a widely accepted measure of personality, and its validity is once again proven in this study.

Most likely, the CU-CN and CU-AP relationships were not significant due to the CU variable. First, it may be attributed to how the data was gathered. Participants were asked to explicitly state the quantity of various caffeinated beverages they consumed in the past month. The amount of caffeine consumed could have been easily underestimated or overestimated. This is a shortcoming of using a self-reported measure. Second, it is possible that the sample size was too small to reveal the relationships between the variables. Relationships that are strong can be found in smaller sample sizes; however, weaker relationships require a larger sample to be discovered. Third, participants in this sample may not consume enough caffeine to make the relationship evident. Nearly 77% of participants reported consuming caffeine 5 days or less in the past month. A wider range of caffeine consumers would have been more ideal.

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It is interesting to discover that time-consuming activities effectively predict AP, such as the number of clubs students are involved in, the number of hours students dedicate to clubs, and employment. Students looking to improve their grades should join a club or two. It is plausible that students involved in clubs schedule their time to socialize, so they are able to plan out their day. Other students who are not involved in clubs may choose to socialize elsewhere and may spend more time with others than they should if they want to have enough time for their studies. However, students must also be careful not to dedicate too much time to these extracurricular activities because that could become counterproductive. If students become very involved with clubs then they may find that their schedule is filled with obligations, leaving them minimal time to complete homework or study for exams. Employment also detracts from AP. Students cannot always rely on their parents to support them financially, so they often work in a part-time job on or off campus. Although they may need the money, the hours spent working in a job could be spent working on their homework. Students should weigh the benefits of making money against taking time away from their schoolwork and thus not performing as well academically as they could.

When CN was also entered into the model to predict AP, only CN and Clubs were able to significantly predict AP. Therefore, students who are very conscientious do not need to seriously consider how they spend their time. This can be attributed to the fact that students with a high level of CN are self-disciplined, strive to achieve, and goal-oriented. They are generally skilled in time management so they may prefer to schedule their socialization. Clubs are an effective way of doing this because they generally have set, reliable times that they meet. Also, students generally are not required to attend every meeting so they may choose to skip if they have a lot of work to complete. Conscientious students are able to make that decision and therefore are able to perform well academically.

The difference in the R^2 figures for the two models highlights the importance of CN in predicting AP. In the first model, about 15% of the variance in GPA can be explained by the number of clubs joined, the number of hours spent involved in the club, CU, and employment. Once CN is entered, the model is able to explain nearly 30% of the variance in GPA. This is a crucial finding. Conscientious students have a significant advantage in their AP. Therefore,

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students who are struggling to achieve good grades can adopt more conscientious practices in their schoolwork and perform well.

This research had several strengths. First, it added knowledge to the body of literature concerning academic performance. There was only one article which examined the three specific variables considered in this study. It is important to consider the effects of CU on college students because many consume products with caffeine and they attend college so that they can do well and have a good career. Second, it discovered what students can do to achieve in their classes. Students who have low CN should join a club or two, not dedicate a lot of time to it, and remain unemployed if possible. Students who have high CN should join a club or two. Third, it was able to replicate past research concerning CN and AP.

Future research should have a larger sample size to reveal any small relationships that were not discovered throughout the course of this research. Under these circumstances, some of the relationships that were not significant in this study may be significant. In addition, a better method of measuring caffeine intake should be used. There is no perfect measure for caffeine intake. Consumers are often unaware of the quantity of caffeine in their food and beverages. Therefore, a self-report measure may not always reveal what is truly happening. The only way to be certain is to administer the caffeine in a lab setting. This is an expensive and time-consuming procedure. Direct observation or the use of personal diet journals may be a good compromise.

APPENDICES

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Appendix A – Correlation Matrix

	CU	GPA	CN
CU	-	r = -0.089 p = 0.282	r = -0.030 p = 0.715
GPA	r = -0.089 p = 0.282	-	r = 0.485* p = 0.000
CN	r = -0.030 p = 0.715	r = 0.485* p = 0.000	-

*Value is significant, alpha < 0.05

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Appendix B – Regression Results: CU, ClubHours, Clubs, Employment

R	R ²	Adj. R ²	Std. Error
0.411	0.169	0.146	0.42487

	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.286	4	1.321	7.320	0.000
Residual	25.993	144	0.181		
Total	31.279	148			

	Unstd. Coefficients		Std. Coef.	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.475	0.151		22.969	0.000
CU	-0.015	0.008	-151	-1.964	0.050
ClubHours	-0.010	0.005	-0.176	-2.160	0.032
Clubs	0.118	0.027	0.362	4.405	0.000
Employment	-0.089	0.040	-0.172	-2.222	0.028

Dependent Variable = GPA
 Bold values are significant, alpha < 0.05

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Appendix C – Regression Results: CU, ClubHours, Clubs, Employment, CN

R	R ²	Adj. R ²	Std. Error
0.571	0.326	0.302	0.38402

	Sum of Squares	df	Mean Square	F	Sig.
Regression	10.190	5	2.038	13.820	0.000
Residual	21.089	143	0.147		
Total	31.279	148			

	Unstd. Coefficients		Std. Coef.	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.466	0.222		11.104	0.000
CU	-0.013	0.007	-0.123	-1.765	0.080
ClubHours	-0.008	0.004	-0.141	-1.902	0.059
Clubs	0.090	0.025	0.275	3.631	0.000
Employment	-0.062	0.037	-0.120	-1.700	0.091
CN	0.028	0.005	0.409	5.767	0.000

Dependent Variable = GPA
 Bold values are significant, alpha < 0.05

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REFERENCES

- Bogg, T., & Roberts, B. (2004). Conscientiousness and Health-Related Behaviors: A Meta-Analysis of the Leading Behavioral Contributors to Mortality. *Psychological Bulletin*, 130(6), 887-919. Retrieved May 15, 2009.
- Chen, J. (2005). Relation of Academic Support From Parents, Teachers, and Peers to Hong Kong Adolescents' Academic Achievement: The Mediating Role of Academic Engagement. *Genetic, Social, and General Psychology Monographs*, 131(2), 77-127. Retrieved November 13, 2009.
- Dollinger, Stephen J., & Orf, Lisa A. (1991). Personality and performance in "personality": conscientiousness and openness. *Journal of Research in Personality*, 25, 276-284. Retrieved March 23, 2009.
- Hewlett, P., & Smith, A. (2007). Effects of repeated doses of caffeine on performance and alertness: New data and secondary analyses. *Human Psychopharmacology: Clinical and Experimental*, 22(6), 339-350.
- Julien, Robert M. (2005). *A Primer of Drug Action: A comprehensive guide to the actions, uses, and side effects of psychoactive drugs*. New York: Worth Publishers.
- Klomegah, R. (2007). Predictors of academic performance of university students: An application of the goal efficacy model. *College Student Journal*, 41(2), 407-415. Retrieved January 20, 2010 from PsycINFO database.
- Kohler, M., Pavy, A., & Van Den Heuvel, C. (2006). The effects of chewing versus caffeine on alertness, cognitive performance and cardiac autonomic activity during sleep deprivation. *Journal of Sleep Research*, 15(4), 358-368.
- Lord, Joseph (2007, January 5). Energy Drinks' Sales Explode Despite Concerns. *News and Tribune*. Retrieved from <http://news-tribune.net/homepage/x519361428/Energy-drinks-sales-explode-despite-concerns?keyword=leadpicturestory> on April 13, 2010.
- Musgrave-Marquart, D., Bromley, S., & Dalley, M. (1997, June). Personality, academic attribution, and substance use as predictors of academic achievement in college students. *Journal of Social Behavior & Personality*, 12(2), 501-511. Retrieved March 22, 2009, from PsychINFO database.
- Noftle, E., & Robins, R. (2007). Personality predictors of academic outcomes: Big five correlates of GPA and SAT scores. *Journal of Personality and Social Psychology*, 93(1), 116-130. Retrieved May 15, 2009.
- Poropat, A. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, 135(2), 322-338. Retrieved May 15, 2009.

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- Roberts, B., Walton, K., & Bogg, T. (2005). Conscientiousness and Health Across the Life Course. *Review of General Psychology*, 9(2), 156-168. Retrieved May 15, 2009.
- Rogers, P. (2007, March 2). Caffeine, mood and mental performance in everyday life. *Nutrition Bulletin*, 32, 84-89. Retrieved March 23, 2009, from Academic Search Premiere Database.
- Ruxton, C. (2008, March). The impact of caffeine on mood, cognitive function, performance and hydration: a review of benefits and risks. *Nutrition Bulletin*, 33(1), 15-25. Retrieved March 23, 2009, from Academic Search Premiere Database.
- Sigma Assessment Systems. (2007). NEO Five Factor Inventory. <http://www.sigmaassessmentsystems.com/assessments/neoffi.asp>. Retrieved November 13, 2009.
- Trapmann, S., Hell, B., Hirn, J., & Schuler, H. (2007). Meta-analysis of the relationship between the Big Five and academic success at university. *Zeitschrift für Psychologie/Journal of Psychology*, 215(2), 132-151. Retrieved May 15, 2009.