The Effects of Social Support and Self-Efficacy on Academic Performance
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"This thesis is submitted in partial fulfilment of the Honours degree of Bachelor of Psychological Science (Honours)"

School of Psychology
University of Adelaide
October 2019

Word Count: 9,468

Contents

Abstract

The links between self-efficacy, social support, and academic achievement are well supported in the literature. The number of people, and the perceived satisfaction with the support they offer, is positively correlated with academic achievement, as it reduces stress and influences an individual's choice of coping mechanism. Self-efficacy influences grades by establishing positive behavioural patterns that result in individuals exerting more effort on a given task among other things. And, with increasing emphasis being placed on individual academic achievement, any and all potential aids must be considered in an attempt to attain good marks. The relationship between social support, self-efficacy, and academic achievement is understudied in Australia. It was theorised that individuals with higher levels of these two factors would do better in an end of semester exam. Participants were drawn from the 1st year psychology cohort at Adelaide university and completed measures measuring demographic factors as well as the measures measuring social support, self-efficacy, and control variables. Results from correlational analyses comparing variables and exam marks were all non-significant, except for intelligence. Possible reasons for these results are discussed, as well as future directions for research in this area.

Declaration

"This thesis contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time."

October 2019

Acknowledgements

It's been a long year, but a fruitful one. I have achieved something I never thought I would have, and it was only possible due to support from my friends and family. I would like to thank my supervisor Dr Matt Dry for his unwavering support, and his near constant availability to answer my questions. I'd also like to thank my family and friends for putting up me no matter how stressed I was, or how anti-social I would become when writing. A special thankyou to my mum, who helped proof read my thesis in a more skilled way than I ever could, or would have. Finally, I would like to thank my co-supervisees Joanna and Zandra, for offering so much support for my sometimes stupid questions, and just being reassuring for the entire year.

Introduction

The importance of academic performance in modern society, regardless of culture, cannot be understated. Early education has become increasingly significant as the early years of a child's education have been found to shape attitudes towards learning and the ability to socialise for later school years and life (OECD 1996, pp. 113–114). The importance of academic performance extends into adulthood with individuals being given more opportunities to gain entrance to university than ever before. Individuals who may have failed to gain entry to university from high school due to poor grades are now able to enter via alternate pathways within Australia; namely the Foundation course, and the Special Tertiary Admissions Test (STAT). The ever-expanding desire for individuals to have formal education in their respective fields has, by proxy, placed even greater weight on achieving academically. The consequences of this are both positive and negative in their nature, with university graduates now on average being more qualified than those 10 years ago (Australian Bureau of Statistics [ABS], 2017). This improvement, however, has come at the cost of students' mental health and wellbeing, with students having significantly higher levels of mental health problems than the general population (Stallman, 2010). The same study also found that increases in psychological distress were significantly correlated with decreases in academic performance.

This makes the stress associated with being a university student a closed cycle in that, higher stress leads to worse performance, and that worse performance leads to higher stress levels (Stallman, 2010). The need then for both reducing and preventing stress, is paramount to helping improve academic performance. Social support is known to alleviate an individual's stress, and is thought to also increase academic performance; having good self-efficacy is known to increase an individual's academic performance and is also thought to reduce stress (Bandura, 1977b; Yang, 2004). This leads to the current project, to assess whether higher levels of social support and self-efficacy correlate with better academic performance.

1.1 Social Support

Social support is generally defined as the existence, or availability, of people on whom we can rely, people who let us know they care for, value, and love us (I. G. Sarason, 1980). Social support has long been theorised to increase academic performance; however, it has not been fully understood why. It has been hypothesised that social support benefits individuals as a preventative measure, preventing emotional arousal from reaching the point at which it becomes detrimental (Li, Han, Wang, Sun, & Cheng, 2018; Rueger, Malecki, Pyun, Aycock, & Coyle, 2016). This allows students to avoid burnout and other negative effects associated with high stress levels, which in turn lead to poorer academic performance (Yang, 2004). A U.S. longitudinal study found that perceived social support was a significant independent predictor of a student's academic achievement (DeBerard, Spielmans, & Julka, 2004). Much like the studies mentioned above, the authors believe that social support acted as an insulating buffer, preventing stress from having a negative effect on academic performance. The same study also theorised that, unlike other avoidance coping methods that were related to academic achievement like smoking or drinking, social support allowed individuals to tackle stressors head on (DeBerard et al., 2004). By enabling individuals to effectively remove stressors from their minds, social support, as a result, encourages better academic performance.

Social support has also been theorised to act in a less preventative manner than previously mentioned. Research has shown that high levels of social support are associated with better perceived sense of security, and can also foster a stronger feeling of competence (B. R. Sarason, Pierce, & Sarason, 1990). These benefits are thought to allow an individual to engage and complete intellectual tasks more efficiently than without them, resulting in better academic performance as a result. One study found that learning communities enhanced students individual learning, quality of learning, and was perceived as enriched compared to standard classes (Tinto, 2000). As the students learned more and engaged more socially, they persisted with their studies at a considerably higher rate than students enrolled in the traditional

curriculum (Tinto, 2000). As a result of this persistence they achieved better academically than the traditional curriculum students.

Social support networks also extend into the university faculty. Students studying in a Foundation Course who perceived that their tutors cared about them, personalised with them, and were available for consultations, performed better as a result of the support offered (Peel, 2000). The practical implications from a 2018 study state directly that students who are struggling academically should be offered enhanced social support, either from peers, or from university staff, in the form of comfort, guidance, and advice, as a way to improve their emotional state, and academic performance (Li et al., 2018).

1.2 Self-Efficacy

Bandura (Bandura, 1977a) first defined self-efficacy as "people's judgment of their capabilities to organize and execute courses of action required to attain designated types of performances." In the last 30 years the relationship between self-efficacy and academic performance has become one of significant interest, the research of which is assertive of the fact that self-efficacy has a strong effect on academic performance (Multon, Brown, & Lent, 1991; Yang, 2004). Multon et al found an effect size of 0.38 when looking at the effect self-efficacy beliefs have on performance; across the studies analysed in the meta-analysis they estimated that approximately 14% of the variance in performance was due to self-efficacy beliefs (Multon et al., 1991).

One of the reasons for this effect is that once an individual's perceived self-efficacy towards a task has been established, it is predictive of certain behavioural actions, such as the effort an individual will exert on the given task (Chemers, Hu, & Garcia, 2001; Yang, 2004). When individuals enter university with a strong belief in their abilities they perform significantly better than students with lower confidence in their abilities, students who expect academic success as a result of their work also had better performance than those students who did not expect academic success (Chemers et al., 2001).

Aside from this, Bandura noted 3 key areas in which self-efficacy affected academic performance (Bandura, 1977a): The first was that of choice behaviour. Individuals are more likely to choose tasks in areas they feel confident and capable in, while avoiding tasks in areas they do not. Students are more likely to study and engage with course material over other, possibly, distracting choices when they feel confident in their abilities. This increased engagement could lead to higher grades.

The second area relates to effort expenditure and persistence. Studying hard for coursework and exams is often difficult, and requires higher than normal effort and persistence. If any unexpected difficulties are encountered while studying, such as complex and abstract concepts, or understanding statistical analyses, students will have to work harder than normal to overcome them. Bandura theorised that individuals with a higher sense of self-efficacy would work harder, and persist more against obstacles preventing them from reaching their goals (Bandura, 1977a). Students then attain better grades as a result of their increased effort and persistence.

The third area of self-efficacy of interest relates to an individual's thought patterns. An individual's self-efficacy directly effects the amount of stress they feel when engaging with difficult and challenging tasks, and also relates to the sense of achievement they feel at having successfully completed the task at hand (Yang, 2004). Higher self-efficacy individuals are more likely to set more challenging and rewarding goals, while the level of commitment to achieving those goals is also heightened (Locke, Frederick, Lee, & Bobko, 1984). Higher self-efficacy students are more likely to set goals of higher academic achievement, and more likely to complete the task with less stress, which in turn would lead to higher grades overall.

1.3 Differences Between Methods of Entry to University

Within Australia there are multiple methods of gaining entry to university. The most popular method is via the individuals Australian Tertiary Admissions Rank (ATAR), this is attained by

completing high school and acquiring 90 credits of recognised study, these students account for approximately 26% of entries to university (O'connell, 2018).

The next method is the STAT test, it is a 2 hour long multiple-choice aptitude test in which participants are ranked against other individuals who are taking the test, and have taken the test. The score gained from sitting the STAT allows students to apply to a range of university courses.

The final method considered here is the Foundation Course; This course involves potential students studying for 40 weeks (University of Adelaide, other universities may differ). During their time studying, they will work with tutors and their peers to build a strong academic base. This academic base includes courses on academic writing, science subjects, critical thinking and more. The Foundation Course was originally developed to help students in rural areas who would normally be considered "at risk" to negotiate both entrance, and success, at university (Levy & Murray, 2005). Levy and Murray's paper claimed that the course was a success with over three quarters of students being offered positions at Monash University.

Despite the fact that the aforementioned methods of gaining access to university have co-existed, in one form or another, for over 15 years, there has been little research into the potential differences in academic achievement between groups. A 2004 Taiwanese study found that method of entrance to university had a major effect on students' academic performance (Yang, 2004). Research also shows a relationship between students with higher Grade Point Averages (GPA) and better academic performance (Sladek, Bond, Frost, & Prior, 2016).

However, Levy and Murray (2005) found that students who gained access through the Foundation Course performed similarly with those students who entered through the mainstream. This is thought to be due to two main factors, academic preparedness, and social support.

Social support and self-efficacy between these groups is thought to vary, which would be reflected in the different groups' academic performance. Students who enter university from high school with higher ATARs tend to have studied more academically rigorous subjects such as

science, maths, and economics. This is owing to the nature of the Australian high school system where STEM subjects are "weighted" more heavily, meaning that an average grade in maths would contribute a higher score to a student's ATAR than an above average grade in the arts. It is inferred that these more academically rigorous subjects better prepare students for the highly academic and competitive nature of university, regardless of the subject matter (Tchen, Carter, Gibbons, & McLaughlin, 2001). A 2001 study concluded that Equivalent National Tertiary Entrance Rank (ENTER) scores only predicted a maximum of 39% of a student's first year academic performance, however, predicative ability increased to 51% when students' self-efficacy was factored into the analysis (McKenzie & Schweitzer, 2001). In the area of university academia, self-efficacy can be assessed by measuring an individual's academic preparedness on a self-report measure (Jansen & van der Meer, 2012).

When looking at social support, Yang's 2004 study found that after method of entrance, the second biggest factor explaining variation in performance was social support. It is thought that as social support decreases, psychological distress increases which leads to an increase in burnout and a decrease in academic performance (Yang, 2004). The differences between each of the entry methods would lead to inherent differences in social support. Students from high school would have a much higher level of social support than students who sit the STAT test, as would the individuals who enter through a foundation course. This is because of the support given by both teachers and tutors, which relates directly to the students' academic studies and goals, being important to encourage persistence and commitment (Peel, 2000).

1.4 Intelligence

Intelligence has perhaps, the strongest link with academic performance of any variable. A 2004 study found that it was the most powerful predictor for a wide range of variables, including academic performance (Kuncel, Hezlett, & Ones, 2004). In the 15 years since that paper, intelligence has continued to be found the most significant predictor of academic performance,

whether measured as GPA, course work marks, or exam results (Rohde & Thompson, 2007; Rosander, Backstrom, & Stenberg, 2011; Strobel, Behnke, Gärtner, & Strobel, 2019). Intelligence is thought to share strong relationships with need for cognition, learning ability, and personality traits, amongst other variables (Dandagal, 2017; Deyoung, 2011; Strobel et al., 2019). While the link found between intelligence and academic performance is still debated in the literature, it is thought to be due to these inter-relations with other variables that have a positive link with academic performance.

1.5 Gender

Gender differences in academic performance and intelligence have a long and well researched history. Early psychological thinking was informed by entrenched gender stereotypes; that men are intelligent and calculating, and that women are governed by their emotions. The product of this was that men were thought to be more intelligent than their female counterparts. However, modern research suggests that gender differences in intelligence are most prevalent in adolescent aged individuals, and have generally reduced to non-significant levels by the time individuals reach adulthood. Gender differences in early intelligence are thought to stem from environmental factors, where what children are encouraged to participate in affects their strengths and weaknesses in various abilities (Young & Fisler, 2000).

Differences in academic performance however are generally favourable towards females, with girls out performing boys in school years, and females outperforming males during university (Dayioğlu & Türüt-Aşik, 2007; Pomerantz, Altermatt, & Saxon, 2002; Siddiq & Scherer, 2019). Pre-university age females tend to obtain better overall course grades than their male counterparts, while men however tend to do better on tests of achievement, like the Scholastic Assessment Test – or SAT (D. F. Halpern et al., 2007; Young & Fisler, 2000). However, once at university women have been found to outperform men regardless of how academic success is measured, meaning that women outperform men on tests of achievement and overall course grade (Hyde & Kling,

2003). Other studies have found that gender remains a significant predictor for university GPA, once other individual variables have been controlled (Betts & Morell, 1999). Tests of achievement, like the SAT in the U.S., are significant predictors of whether individual students will graduate, which is why high scores are so highly prized. Despite the importance of achievement tests in predicting graduation, gender has been found to have a larger and more powerful relationship with graduation levels, again indicating the importance of gender in higher education (Kim, Rhoades, & Woodard, 2003).

The reasons why females outperform males are still unclear. As discussed, gender differences in intelligence are not significant by the time of adulthood, so intelligence cannot account for the difference in performance. It has been theorised that female students, on average, work harder, study more, and attend classes more often than male students do on average (Wainer & Steinberg, 1992; Weisberg, DeYoung, & Hirsh, 2011).

1.6 Personality

The link between personality and academic performance is well researched, and despite mixed results, conscientiousness is considered to be the most robust predictor and correlate of academic performance out of any of the Big Five personality traits (Chamorro-Premuzic & Furnham, 2003; Chowdhury & Amin, 2006; De Feyter, Caers, Vigna, & Berings, 2012). The research has shown that conscientiousness' traits have a positive impact on students, from school level through post graduate studies (Chamorro-Premuzic & Furnham, 2003). This is due to the make-up of conscientiousness' sub-facets, which involve self-discipline, aiming for achievement, thoughtfulness, being systematic, and being deliberate in their actions. This leads to higher levels of studying, and more systematic studying, which in turn leads to higher grades, and has been theorised to act in a compensatory manner to make up for lower levels of intelligence (Furnham, Moutafi, & Chamorro-Premuzic, 2005).

Neuroticism has been found to share a negative significant relationship with academic performance. This is due to neuroticism having a high make-up of anxiety and stress related sub facets, these have been theorised to have strong negative effects in exam performance primarily, as well as having a generally negative affect on an individual's academia through classroom absence, illness, and lowered self-concept (Chamorro-Premuzic & Furnham, 2003; Hakimi, Hejazi, & Lavasani, 2011).

The research suggests that extraversion has a mostly negative effect on academic performance, due to the nature of extraverted individuals to prioritise socialising over studying (T. Chamorro-Premuzic & Furnham, 2003). However, research findings are mixed with studies reporting non-significant relationships between extraversion and academic performance regardless of direction (De Feyter et al., 2012).

Some research has indicated that openness may also contribute to the academic performance of young adults, especially influencing individuals abilities in maths and reading (Alexander Beaujean et al., 2011). The positive effects of openness on academic performance are most prevalent when using grade point average (GPA) as the measure (O'connor & Paunonen, 2007). Research has shown that other forms of academic performance such as exam grade, thesis results, and classroom performance are not as strongly linked to openness as overall GPA (O'connor & Paunonen, 2007).

Studies on agreeableness have also reported mixed findings, with research finding significant results, both positive and negative, while other studies report no significant relationship between agreeableness and academic performance whatsoever (Gray & Watson, 2002; O'connor & Paunonen, 2007; Paunonen, 1998). The results of a major meta-analysis concluded that agreeableness was not a significant determinant of academic performance (O'connor & Paunonen, 2007).

1.7 Current Study

Despite mixed findings, social support and self-efficacy are thought to be significant predictors and strong correlates of academic performance. The goals of the current study are:

1. To assess whether there are any significant differences in academic performance between different methods of entry to university.

2. To assess both intelligence and conscientiousness' contributions to academic performance

3. To identify the role of social support and self-efficacy in academic performance.

4. To explore the relationship between social support, self-efficacy, and personality.

5. To explore the effects of gender on academic performance.

6. To explore the effects of personality on academic performance.

Method

2.1 Participants

Participants for the study were made up of first-year University of Adelaide psychology students. To obtain part of their course credits, all first-year psychology students must participate in research studies for course credit
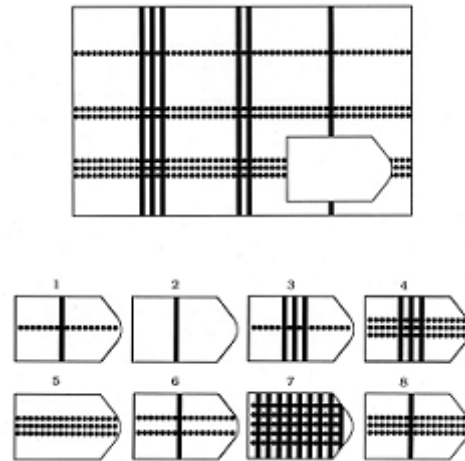
2.2 Measures

Demographics

The first measure completed by participants asked them for basic demographic information, including their age, gender, and method of entry to university.

OCEANIC – (Schulze & Roberts, 2006)

Participants then completed the OCEANIC, a short form 45 item personality test which measures the five major personality traits; Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. It is a 45-item measure with participants responding on a 1-6 Likert scale ranging from strongly disagree to strongly agree. Items are statements containing descriptors relevant to the specific personality trait, for example; Openness sample items include statements such as "I have excellent ideas," while Neuroticism item statements might include "I get irritated easily," with participants then rating their response on the 1-6 scale.

Ravens Advanced Progressive Matrices (APM) – short form - (Bors & Stokes, 1998)

Participants also completed a short form version of Ravens APM. The measure is made up of progressively more difficult items where the participant is required to choose which solution from a selection of 8 options, best completes the pattern design presented (Figure 1). The measure assesses participants intelligence and has a .92 correlation with the long form Ravens APM, with acceptable internal consistency (alpha = .73).

Figure 1 - Ravens APM example item.

Social Support Questionnaire 6 (SSQ6) – (I. G. Sarason, Sarason, Shearin, & Pierce, 1987)

The SSQ6 measures participants perceived levels of social support. It was developed as a short form alternative to the original Social Support Questionnaire (SSQ), and correlated highly with the SSQ albeit with a much-reduced administration time. Participants respond to 6 questions, all with a part A and a part B.

Part A asks participants how many people they could count on given a specific stress or situation, with responses ranging from 0 - 9+. For example, question 1A asks "How many people can you really count on to distract you from your worries when you feel under stress?"

Part B asks participants to then rate on a Likert scale from 1 – 6, with 1 being "Very Dissatisfied" and 6 being "Very Satisfied," how satisfied they are with their level of support. A participant's social support score is the combined total of all 6 questions, with a higher score indicating a higher level of perceived support. Scores are individual to each sample administered, in that they can only be compared to other scores within the same sample, there is no scoring guide for "high" "medium" and "low" social support scores.

Readiness and Expectations Questionnaire (REQ) – (Jansen & van der Meer, 2012)

Self-efficacy was measured using the Readiness and Expectations Questionnaire, which was developed to measure incoming student's perceptions about university and gauge how well prepared they thought they were. The Readiness and Expectations Questionnaire ties into theories about self-efficacy, in that those students who feel better prepared will have better success at university than students who are less confident.

It is made up of 21 items that are scored on a 1 – 6 Likert scale that ranges from "1 – Strongly Disagree" to "6 – Strongly Agree." Questions are grouped into 6 indexes; Time-Management Readiness, Written Communication, Group Work, Information Processing, Information Communication Technology (ICT), and Verbal Communication. Sample questions include "I am good at planning and organising my study," "I can independently write a short report," and "I am confident working in small groups." Similarly, to the SSQ6 the scores are summed, with a higher score indicating a more "prepared" participant.

2.3 Procedure

The above-mentioned measures were placed in an online survey, and split into 2 halves. Participants signed up to the study online and were redirected to a survey hosting website to complete the first half of the study, upon completion of the first half they were given a link that directed them to the second half of the survey. This was done to reduce any cognitive fatigue that may have been incurred by completing all the measures at once. The second half of the study could be completed at any time after the first half, with participants being asked to complete them in a distraction free environment. The first half contained the demographic questionnaire, OCEANIC, and Ravens APM tests, while the second half contained the Social Support Questionnaire 6 and the Readiness and Expectations Questionnaire. Data collection proceeded for 6 weeks.

Results

Seventy-four participants completed both surveys making them eligible for analyses. However, three individuals did not complete the final exam, and as a result were removed from the final data set prior to analyses. In total 71 individuals took part in the study, age ranged between 16 and 59, with a mean age of 19.7. The sample was made up of 49 female and 22 male participants, 55 (77.5%) individuals entered university directly from secondary school using their ATAR, 6 (8.5%) participants completed the STAT test to gain entry to university, 3 (4.2%) completed a foundation course to gain entrance to university, while 7 (10%) entered by "other" means.

Histograms indicated potential deviation from the assumption of normality for the variables measured in the current study. However, Inspection of the QQ plots indicated the points were distributed evenly along a reasonably straight line. As such the use of parametric tests was permitted.

3.1 Comparing across method of entry

One of the main goals of this study was to assess the potential differences in academic performance between the different methods of entry to university. The participants in this study primarily came from the traditional method of entry, by using their ATAR (55). While only 9 participants entered from either the STAT test or Foundation course, this meant that it was not possible to make any meaningful comparisons across groups.

As discussed in the introduction, we would have expected to find significant differences in social support and self-efficacy levels between the 3 groups, with ATAR entry students having the highest levels of both, Foundation Course students having the second highest levels of both, and then STAT test individuals having the lowest levels of both. Because of the lack of diversity, the sample will be considered as a whole.

3.2 Previously implicated predictors of Academic Performance

As discussed in the introduction, the two most robust predictors of academic performance are intelligence and conscientiousness. Intelligence has long been linked to academic performance; with many studies concluding it is the most important factor when predicting performance.

The results of the current study indicated that the APM had a moderate positive correlation with performance on the end of semester exam ($r = 0.34$, $p = 0.03$). This accounts for approximately 12% of the total variance in academic performance.

Results of the current study found that conscientiousness had a small positive correlation with academic performance, however it was non-significant ($r = 0.19$, p 0.11). This stands in contrast with much of the previous literature which has consistently found that conscientiousness is strongly related to academic performance, potential reasons are addressed in the discussion.

3.3 Relationship between Social Support and Academic Performance

Past literature has found that social support correlates well with academic performance, however the current study found no significant relationship between social support and academic performance as measured by the Social Support Questionnaire 6. As previously indicated, Part A of the SSQ6 measured social support in terms of the number of individuals available to provide social support, the correlation between Part A and academic performance was close to 0 ($r = -0.07$, $p = 0.54$). Part B of the SSQ6 measured the degree of satisfaction individuals felt with the available social support, in this case, there was a weak positive relationship between Part B and academic performance, however the correlation was non-significant ($r = 0.15$, $p = 0.21$).

3.4 Relationship between Self Efficacy and Academic Performance

Previous studies have indicated a positive relationship between self-efficacy and academic performance. In the current study self-efficacy was measured by the Readiness and Expectations questionnaire, and as can be seen in Table 3 there was a weak positive correlation with academic performance. However, this was also found to be non-significant ($r = 0.13$, $p = 0.33$). The possible reasons why this result was found are addressed in the discussion section.

3.5 Interactions between Social Support, Self-efficacy, and Personality

In the following section we will further examine the relationships between the measures of social support, self-efficacy, and personality variables. Social support interacted with a number of the other variables measured in the current study, as can be seen in Table 1.

Table 1 – Pearson's correlation matrix of variables measured.

	O	C	E	A	N	SSQPA	SSQPB	REQ	APM	Grade
O	-	0.22	0.13	0.26*	0.35**	-0.04	-0.11	0.03	0.03	0.14
C		-	0.18	0.23	-0.02	-0.09	0.15	0.42**	-0.1	0.19
E			-	0.37**	0	0.46**	0.25*	0.24	0.05	0.13
A				-	-0.09	0.15	0.07	0.34**	-0.12	-0.06
N					-	-0.25 *	-0.13	-0.22	0.1	0.15
SSQPA						-	0.4**	0.27*	0	-0.07
SSQPB							-	0.45**	-0.08	0.15
REQ								-	-0.01	0.13
APM									-	0.34*
Grade										-

Note: * = $p < 0.05$ ** = $p < 0.01$, SSQPA = number of individuals available for support, SSQPB = the satisfaction with available social support, REQ = self-efficacy.

The first half of the scale, which measures the amount of people an individual feels they can rely on, had a strong positive and highly significant relationship with extraversion, previous research has found similar results. Past literature has suggested a negative link exists between

social circle size and neuroticism, the current study found similar results with a moderate negative and significant relationship between neuroticism and the SSQPA. The SSQPA also shared a moderate positive correlation with self-efficacy that was significant, this is a relationship that has also been found in past literature.

The second half of the scale, which measures satisfaction levels on support received, also had a moderate positive and significant correlation with extraversion. Unlike the first half of the scale, the SSQPB did not have a significant relationship with neuroticism, but the relationship was also negative in nature. It did correlate strongly and significantly with self-efficacy however.

Self-efficacy shared a number of significant relationships with other variables, the first one being conscientiousness. As can be seen in Table 1 the correlation between conscientiousness and self-efficacy was moderate/strong and positive in nature, this adds to previous research with similar findings. In the current study self-efficacy also shared a moderate positive significant relationship with agreeableness, this replicated past research which found similar results. Self-efficacy also shared relationships with both halves of the social support measure, as previously mentioned.

3.6 Gender differences

As indicated in the Introduction evidence relating to the effect of gender on academic performance is mixed. In the current study unequal group sizes were present, violating an assumption of parametric testing, as such the comparison was made using a nonparametric Mann-Whitney test. Exam results differed significantly based on gender (U=365, $p = 0.03$) with female participants ($M = 76$) scoring significantly higher than male participants ($M = 68.5$) on average. As a result of this, separate correlational matrices were calculated for both male and female participants to examine any potential suppression effects.

Table 2 – Pearson's correlation matrix of conscientiousness, APM, SSQPA, SSQPB, and self-efficacy for male participants.

	Grade	Conscientiousness	APM	SSQPA	SSQPB	Self-efficacy
Grade	-	-0.3	0.59**	0.11	0.12	0.14
Conscientiousness		-	-0.21	-0.02	0.11	0.46*
APM			-	-0.12	0.00	0.19
SSQPA				-	0.64**	0.38
SSQPB					-	0.33*
Self-efficacy						-

Note: $p < 0.05$ = * $p < 0.01$ = **, SSQPA = number of individuals available for support, SSQPB = the satisfaction with available social support, REQ = self-efficacy.

Table 3 – Pearson's correlation matrix of conscientiousness, APM, SSQPA, SSQPB, and self-efficacy for female participants

	Grade	Conscientiousness	APM	SSQPA	SSQPB	Self-efficacy
Grade	-	0.28	0.22	-0.09	0.12	0.10
Conscientiousness		-	-0.08	-0.06	0.13	0.46**
APM			-	0.06	-0.13	-0.16
SSQPA				-	0.34*	0.25
SSQPB					-	0.44**
Self-efficacy						-

Note: $p < 0.05$ = * $p < 0.01$ = **, SSQPA = number of individuals available for support, SSQPB = the satisfaction with available social support, REQ = self-efficacy.

As can be seen in Tables 2 and 3 different correlations are found for male and female participants, suggesting the presence of gender suppression effects. Surprisingly, male participants' conscientiousness, while non-significant, shared a moderate negative correlation with end of semester exam mark. Male participants' end of semester exam grade correlated positively and strongly with the APM; this relationship was also significant, as previously mentioned literature has indicated that intelligence is one of the most robust predictors of academic performance. Past research has suggested that conscientiousness and self-efficacy

correlate with one another. In the present study male participants' conscientiousness had a strong positive and significant relationship with self-efficacy. Unsurprisingly both halves of the Social Support Questionnaire 6 correlated strongly and positively together. Finally, in male participants the SSQPB shared a strong positive and significant relationship with self-efficacy.

Female participants' relationship between conscientiousness and end of semester exam grade was non-significant and a similar size to that of the male participants, however it was positive. Despite previous literature indicating that a strong relationship exists between intelligence and academic performance, in the current study female participants' APM scores shared no significant relationship with end of semester exam grade. As found in previous research, and similar to male participants, female participants' conscientiousness shared a strong positive and significant relationship with self-efficacy. Self-efficacy correlated strongly and positively with the SSQPB; this correlation was stronger than that found in male participants.

Discussion

The main purpose of this study was to examine the relationship between social support, self-efficacy, and academic performance in first year psychology students. Neither social support or self-efficacy had a significant relationship with academic performance. Unfortunately, due to the nature of the participant pool, no tests were conducted to compare the three methods of entry to university and their effects on academic performance, therefore these will not be discussed. As expected, intelligence (Raven's APM) had both a significant positive correlation with academic success, and could account for 12% of the variation in academic performance. No facet of personality had any significant relationship with academic performance. Gender was found to have a significant effect on academic performance, and exerted suppression effects on the results. The various interactions between personality and the other variables measured will be considered as well. The possible reasons for these findings and their implications will be discussed variable by variable below, before limitations are discussed.

4.1 Intelligence and Conscientiousness

As expected scores on Raven' APM were found to have a moderate positive significant relationship with academic performance, a result which has been found in previous literature on the topic. Intelligence has long been thought of as a predictive factor for academic performance and this research adds to that body (T. Chamorro-Premuzic & Furnham, 2008; T. Chamorro-Premuzic, Quiroga, & Colom, 2009; L. J. Song et al., 2010). Surprisingly, it was the only significant predictor of academic performance for the sample as a whole, and could account for more variance in academic performance than any other single variable.

Similarly to past research, scores on conscientiousness had a weak negative, but not significant, correlation with scores on the APM. In past research this has been attributed to the theory that higher levels of conscientiousness arise as a compensatory response to lower levels of intelligence (T. Chamorro-Premuzic, Furnham, Adrian, 2014). However, as the result is not

significant it cannot be said for certain whether or not this is what has occurred in the current study.

Moving on, conscientiousness had the largest correlation with exam grades out of the Big Five personality traits, however, it was still not significant. This contradicts much of the current literature, where conscientiousness is found to have the strongest and most significant relationship with academic performance of any personality facet (O'connor & Paunonen, 2007). However, the size of the correlation presented here was within the confidence intervals reported in a major meta-analysis, meaning that perhaps the sample size in the current study wasn't large enough to find an effect (O'connor & Paunonen, 2007). Another potential reason could be that extremely high levels of conscientiousness have been found to have a detrimental effect of academic performance. Rather than conscientiousness exerting a linearly positive effect on GPA, researchers found that it was somewhat quadratic, which led to higher scores having a negative effect on grades (Cucina & Vasilopoulos, 2005).

4.2 Social Support and Academic Performance

The results found for social support and its effects on academic performance contradicted the expectations laid out in the introduction. This finding was quite unexpected, as from middle school through tertiary education, social support has been found to have a significant relationship with academic performance (López, Ehly, & García-Vásquez, 2002; Srikanth, Petrie, Greenleaf, & Martin, 2015; Yang, 2004). Interestingly, when both halves of social support were combined there was no relationship, or predictive ability for academic performance, despite the fact that when separated they had small non-significant relationships and predictive ability. This is not a finding reflected in past literature which found that social support had, at least, small effects on academic performance (J. Song, Bong, Lee, & Kim, 2015).

A potential reason for this could be due to the socioeconomic make-up of the sample. Adelaide University is in the top 1% of universities world-wide, and top universities in Victoria

have less than 20% of students enrolled from low Socioeconomic Status (SES) areas (Cook, 2018). Without knowing for certain the make-up of the sample, we could assume that a similar issue arises in South Australia. However, the positive effect of social support on academic performance has been found to be nullified if individuals were from a high SES area, while in individuals from lower SES areas, social support maintained its significant relationship with academic performance (Malecki & Demaray, 2006). If the sample in this study were from mainly higher SES areas, this could explain why social support did not have a significant relationship with their end of semester exam results, without knowing the SES make up however, we cannot be certain of this conclusion.

Part A of the Social Support Questionnaire 6 was found to have a strong, positive, and significant relationship with extraversion. This relationship has also been found in past literature, with one study finding extraversion to be the only significant personality facet to predict an individual's self-rated number of friends (Selfhout et al., 2010). It makes sense then, that higher levels of extraversion would correlate with the number of people they could expect social support from (Pollet, Roberts, & Dunbar, 2011). This could explain why social support was unrelated to academic performance, as extraversion has been linked to decreases in academic performance. Individuals high in extraversion are theorised to enjoy better social lives, and have a higher level of distractibility, resulting in poorer performance at university (Bauer & Liang, 2003).

4.2.1 Relationship between Social Support, Self-efficacy, and Personality

Part A of the Social Support Questionnaire 6 was significantly negatively related to neuroticism. This has been theorised to be due to the negative emotional coping styles employed by individuals high in neuroticism, which can leave people feeling worse, and in turn lead to losing friends to confide in (Zellars & Perrewe, 2001). Finally, Part A also shared a significant relationship with self-efficacy, at the current time this is thought to be linked to its shared

relationship with extraversion. People high in extraversion are more active in class discussion, and ask more questions more frequently than individuals low in extraversion (Ciorbea & Pasarica, 2013). The higher levels of course engagement, or perceived course engagement, could lead to a higher feeling of self-confidence, which may then influence levels of self-efficacy.

Part B of the SSQ6 also shared a positive significant relationship with extraversion, albeit a much smaller one, as found in Part A. Part B measured how satisfied individuals were with the social support they received, rather than the number of people they could expect support from. This is most likely due to the fact that extraverts, due to lower levels of arousal, are more likely to seek out social interactions with friends, especially when in need of support for coping with problems (Swickert, Rosentreter, Hittner, & Mushrush, 2002). This theory has been lent support from studies finding that extraverts report utilising social support more often to cope with their problems (Lu, 1997; Stokes, 1985). And that some sub facets of social support, including feelings of belonging and tangible aid, are strongly linked to extraversion (Swickert et al., 2002).

As mentioned earlier, both halves of the Social Support Questionnaire 6 correlated positively and significantly with self-efficacy, this is supported by previous literature across a range of cultures, indicating a possibly universal link (Torres & Solberg, 2001; Yusoff, 2012). Research has indicated that familial social support has the strongest link to self-efficacy, unfortunately this could not be deduced in the current study as the distinction between sources of support was not measured.

4.3 Self-efficacy and Academic Performance

As opposed to most of the current literature on the topic, self-efficacy was not positively related to academic performance. The most likely cause of this lack of finding was the measure used to gauge self-efficacy. The Readiness and Expectations Questionnaire was developed to act specifically in a first-year university student context, which made it ideal for the current study's sample. However, social cognitive theory dictates that self-efficacy has the strongest predictive

power for academic performance, when it is measured at a level similar to the prospective

measure of academic performance (Bandura, 1997). While the REQ had items relating to time

management, ability to process information, ability to work in groups, independent learning, and

writing ability, it did not have items related to an individual's ability to perform well in exams.

The importance of specificity when assessing self-efficacy's relationship with academic

performance was highlighted in a 2005 study which found that course specific measures of self-

efficacy had the strongest relationship with grades, and yielded the most predictive power (Choi,

2005). With this knowledge, the Readiness and Expectations Questionnaire would most likely

have better predicted course work grades or final grades, rather than final exam mark.

4.3.1 Relationship between Self-efficacy and Personality

Interestingly, self-efficacy was found to share a number of other significant correlations

with other variables within the study, the first being conscientiousness. The correlation found is

in line with previous literature which has found similar results, especially where self-efficacy was

measured early on in the course (Lee & Klein, 2002). The same study found that self-efficacy,

when measured later, had a non-significant relationship with conscientiousness. If measured

early enough, students would not have received any grades back, and potentially assumed they

were doing better than they were, and felt higher levels of self-efficacy as a result. In previous

literature the sub facets of conscientiousness contributed to the relationship found with self-

efficacy, with feelings of orderliness, persistence, and tenaciousness having the strongest effects

on thoughts of successful performance (Di Giunta et al., 2013). While the current study did not

examine the underlying facets of conscientiousness, it is safe to assume similar results to

previous literature would be found due to the strong overall relationship between

conscientiousness and self-efficacy.

As well as conscientiousness, self-efficacy was also significantly positively related to

extraversion, however this could be a result of the measure used. The Readiness and

Expectations Questionnaire does ask many questions relating to ability to work in groups, and ability to work collaboratively with academic staff. Individuals who are high in extraversion tend to interact aggressively in group situations, with the relationship having been found significant previously (Balthazard, Potter, & Warren, 2002). This proposed link would explain the relationship found between the Readiness and Expectations Questionnaire and extraversion.

Finally, agreeableness and self-efficacy were also found to be significantly related; this is most likely due to similar factors that caused extraversion and self-efficacy to be related. As the sub facets of agreeableness include friendliness, cooperativeness, and being flexible, and the Readiness and Expectations Questionnaire has many items relating to the ability to work with others, it makes sense that these two would be related. This is further reflected in the correlational strength between the two variables, which is larger than the correlation between extraversion and self-efficacy. While past research has found positive significant relationships between agreeableness and self-efficacy in group-work settings, the results for general self-efficacy are not as clear (Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli, 2011; Thoms, Moore, & Scott, 1996). Had a more exam specific measure of self-efficacy been used, this relationship may have not been significant.

4.4 Gender

The findings on gender were perhaps the most interesting of the current study, with significant differences between males and females being found. When considered as a single variable, gender had significant correlations with conscientiousness, neuroticism, and exam grade. When separated female participants were found to score significantly higher on the final exam, averaging an entire grade boundary above male participants. In an attempt to find the cause of this difference, separate correlation matrices were calculated for male and female participants. The results of these matrices revealed that in male participants, APM score correlated significantly with exam grade, self-efficacy correlated significantly with conscientiousness, both

halves of the Social Support Questionnaire 6 correlated significantly with each other, and Part B of the Social Support Questionnaire 6 correlated significantly with self-efficacy. In female participants no measure correlated significantly with academic performance, however, self-efficacy and conscientiousness correlated significantly, as did both halves of the Social Support Questionnaire 6, and Part B of the Social Support Questionnaire 6 and self-efficacy.

As mentioned above, despite exhibiting a strong and highly significant correlation between academic performance and intelligence, male participants still scored significantly less on the final exam compared to their female counterparts. This could be due to the measure of intelligence used in the current study, Raven's APM is thought to primarily test an individual's fluid reasoning capabilities. And past research has found that males outperform women in measures that require visuo-spatial manipulation and when fluid reasoning is required for task completion (Df Halpern, 1997; Diane Halpern & LaMay, 2000). As well as this, males from the ages of 15 onwards have also been found to outperform women on Raven's progressive matrices, so the result that male participants had a stronger relationship between their APM scores and their final grades may not be as unusual as first perceived (Lynn & Irwing, 2004). As for why this significant relationship did not equate to higher exam grades for males, multiple choice exams typically require the use of recognition and retrieval from an individual's long-term memory. Females have been found to have better ability to retrieve information from their long-term memory over males (Diane Halpern & LaMay, 2000). This would explain why, despite a significant relationship between intelligence and grade in males, they scored significantly lower on the final exam compared to female participants. It would also explain why female participants' correlation between their APM scores and grade was non-significant, due to the above-mentioned suggested differences in intelligence between males and females.

Despite the moderate negative correlation between male participants' conscientiousness and exam performance not being significant, it is interesting. Conscientiousness is regarded as one of the most robust predictors of academic performance, though its relationship was not

significant in the current study, the size of the correlation warrants further investigation. Past research has found that the relationship between academic performance and conscientiousness was non-linear (Cucina & Vasilopoulos, 2005). This could have also affected the current sample, explaining the negative correlation found in male participants.

4.4.1 Relationship between Gender, Social Support, Self-efficacy, and Personality

When considering the relationship between self-efficacy and conscientiousness, both male and female participants exhibited strong significant correlations, surprisingly when the sample was considered as a whole, the correlation became slightly weaker. A large-scale meta-analysis indicated that the differences between males and females in academic self-efficacy was minimal, with males being slightly more efficacious (Huang, 2013). With gender differences becoming most prevalent after age 23, and the current studies' mean age being less than 20, it makes sense that no differences were found. The current findings add to the body of research demonstrating no significant differences between males and females.

Another interesting gender difference was found in the correlations between the first part of the Social Support Questionnaire 6, which measures the number of individuals available for support, and the second part, which measures the level of satisfaction individuals feel with the support they received. In male participants the correlation was much stronger, almost double that of the female participants. This could simply indicate that in men, more friends allow for greater support, whereas in women the quality of those friendships are more important. Past research has suggested that there is a difference in perceived social support between males and females, with factor analysis revealing different models for men and women (Matud, Ibáñez, Bethencourt, Marrero, & Carballeira, 2003). However, this difference could simply be due to the difference in samples size between male and female participants, as when considered as a whole sample the correlation between both halves of the measure were closer to those found in female participants rather than the males. Future research should attempt to discover what causes the

gender differences observed in the current study, between number of individuals available for social support, and the satisfaction felt with that support.

The correlation between the second half of the Social Support Questionnaire 6 and self-efficacy also varied by gender; however, the difference was not significant. Interestingly when the sample was considered as a whole, the correlation was larger. Reasons for why this may be are unknown at this point.

Finally, results of a Mann-Whitney U test revealed that female participants scored significantly higher on neuroticism than their male counterparts. Previous literature suggests that gender differences in neuroticism are not uncommon, with women typically scoring higher than males (Weisberg et al., 2011). While research proposes that neuroticism has a negative relationship with academic performance, in the current study it was positive, though not significant. The significantly higher levels of neuroticism found in female participants could have had some positive effect on the exam grades found in female participants. Further discussion as to why neuroticism has a positive correlation with exam grade is discussed in the personality section below.

4.5 Personality and Academic Performance

Despite a well-established literature base linking personality and academic performance, the current study found no evidence that personality factors have any relationship, or predictive ability with regards to academic performance.

As a general response as to why no facet was significant, an after the fact power analysis revealed that to find a significant correlation of 0.2, a sample size of approximately 81 participants would have been needed. Considering that a large-scale meta-analysis found similar sized correlations to some of those reported here, except with much larger sample sizes it seems reasonable to suggest that the lack of significant results could be attributed to the sample size (O'connor & Paunonen, 2007). In the following paragraphs, each personality traits findings and

implications of those findings will be discussed in order of their standing within the OCEAN layout. Conscientiousness will be omitted due to it being discussed alongside intelligence at the beginning of the discussion.

In the current study, openness shared a weak relationship that was not significant with academic performance; a finding that fits within the current understanding that openness has an ambiguous link to grades. Some studies have reported correlations of r = 0.4 with crystallised intelligence, which then exerts a positive effect on academic performance (Zeidner & Matthews, 2000). Building on this, older studies found that openness had no direct relationship with GPA, instead having positive effects on various intermediary factors like critical evaluation of literature, searching literature, and making relationships, which in turn exerted a positive effect on GPA (Blickle, 1996). When a study investigated the individual sub facets of each Big Five trait and their relationships with academic performance, they found that openness had a negative relationship with exam performance (de Fruyt & Mervielde, 1996). As openness is made up of facets relating to creativity and fantasy the researchers theorised that these abilities do not transfer well to the academic nature of university, which resulted in worse exam results (de Fruyt & Mervielde, 1996). Furthermore, a large scale meta-analysis also suggested that openness' effect on academic performance could be moderated by a third variable, which would explain why there is such variation amongst the current literature (O'connor & Paunonen, 2007). While openness had a positive correlation in the present study, it was not significant, therefore either of these theorised explanations could be the cause for the lack of significant relationship.

Extraversion had a small positive significant correlation with exam results; Results of a major meta-analysis found that extraversion had a small negative correlation with academic performance, despite this the literature has no consistent consensus (O'connor & Paunonen, 2007). The current result's positive direction could be explained by the fact that extraverts have good interpersonal skills, ask more questions, and are more active in class discussions (Ciorbea & Pasarica, 2013). However, negative results could be explained by the fact that individuals high in

extraversion have more active social lives, reducing the available time for studying. It is also theorised that high extraversion individuals have higher levels of distractibility, reducing their attention in class, and their ability to focus on assignments and revision (Bauer & Liang, 2003). Without knowing about individuals' social lives and attention it is hard to say with any certainty if they had an unseen effect on the current result. But if both theorised positive and negative effects were present it would explain the close to zero result found.

As mentioned in the introduction, agreeableness has no clear effect on academic performance in the current literature, with some studies reporting significant positive results, others reporting negative significant results, and other studies reporting nonsignificant results both positive and negative (O'connor & Paunonen, 2007). A potential reason for the lack of significant finding was due to using final exam mark as the measure of academic performance. The sub facets of agreeableness involve measures of kindness, selflessness, generosity, and fairness; these have been theorised to have the strongest influence on academic performance based on group work (Chowdhury & Amin, 2006). With this in mind, if academic performance had been measured based on group work or assignment grades, a stronger and potentially significant relationship might have been found. Knowing this, the current result, based on exam mark, is not abnormal. However, without having assessed various forms of academic performance it cannot be said for certain.

Finally, neuroticism was found to have no significant relation with academic performance, however, it was positive in nature, going against the general theory that neuroticism has a negative effect on academic performance. Theory suggests that due to the characteristics of neuroticism (anxious, nervous, and tensed) it would have a negative effect on academic performance, especially during exam settings (De Feyter et al., 2012). This theory has also received support from much of the research, which has found that neuroticism correlates negatively with grades (T. Chamorro-Premuzic & Furnham, 2008; Chamorro-Premuzic & Furnham, 2003). More recent studies however, have found significant positive effects, and found

that the relationship between self-efficacy and neuroticism may have mediating effects, that lead to a positive relationship between neuroticism and academic performance (De Feyter et al., 2012). Mild arousal levels lead to increases in performance, and as anxiety makes up part of neuroticism, perhaps low levels of neuroticism could also lead to increases in performance. These two factors could explain why female participants scored significantly higher on the exam, despite having significantly higher scores on neuroticism.

4.6 Limitations and Future Research

As implied throughout, there are multiple limitations present in the current study. The first is the size of the sample. As mentioned, an after the fact power analysis revealed a minimum of 81 participants were required to find a significant correlation of 0.2, however in the current study only 71 participants were eligible for data analysis, meaning that any effects that were present may have gone unfound due to a lack of power. Furthermore, the homogeneity of the sample all being first year psychology students further mars any generalisability of the results across all tertiary students. To counter this, further research should recruit participants across all disciplines at university, and across all years of a degree, not only should this make the results more generalisable, it should result in a large enough sample so that if there is a significant result, it will be found.

The major limitation surrounding the measure of social support used in the current study was that it did not differentiate between various sources of support, such as family, friends, and spouse. Because of this, it was impossible to assess whether or not any one source of support had a greater effect than another, or if there were any mediating or moderating interactions between the sources. Therefore, future research should make use of a measure that does differentiate between the above-mentioned sources of support to better understand their effects on academic performance.

Unfortunately, the use of a self-efficacy measure that was not designed to measure exam related self-efficacy could have been key in not finding a significant result. Therefore, the current finding may be misleading in its finding that self-efficacy is not related to academic performance. Consequently, future research should focus on developing a measure of self-efficacy more related to psychology exams. It could include example questions, and then ask participants how confident they are they could correctly answer the question. It should also focus on basic psychological constructs to increase its utility across various universities and different course structures. Furthermore, the relationship between self-efficacy and personality traits were most likely influenced by the measure used in the present study. For this reason, different forms of self-efficacy, such as academic, general, exam, and group work, should all be measured individually to discover whether or not the different personality traits interact differently with different forms of self-efficacy

Personality represented one of the largest areas of problem during the discussion. The lack of any significant finding made it hard to draw meaningful conclusions about the influence personality had on academic performance. While past research has found that some of the Big Five trait's effects were mediated by third variables, the small sample size could account for the lack of significant finding, rather than any unseen variable. Due to this, future research could expand the measurement of personality traits and academic performance to include potential third variables mentioned throughout the discussion to assess whether they do affect the relationship between traits and performance. Another area for improvement would be to use several measures of academic performance, such as GPA, course work grades, and exam grades to evaluate any potential differences in the effects different traits have for different measures of performance. One of the most interesting findings was the negative relationship between conscientiousness and academic performance in males. While this could be due to the small sample size, past research has indicated a potentially non-linear relationship between conscientiousness and academic performance, with high levels of conscientiousness having a

negative effect. This should be researched more fully as conscientiousness is considered one of the most robust predictors of academic performance, a non-linear relationship could expand our understanding, and potentially undermine previous research findings. Finally, the relationship found between neuroticism and academic performance did not align with previous research, as the correlation was positive, though not significant, in nature. As a result of this, future studies should examine the interaction between neuroticism and self-efficacy, and the underlying sub facets of neuroticism, to better ascertain the effect it could have on academic performance.

4.7 Conclusions

There are several interesting conclusions that can be drawn from the current study, the first is that intelligence accounts for approximately 12% of the total variation in academic performance and was the only significant predictor of academic performance. Conscientiousness was non-significant in the current study, indicating the possibility that intelligence is still a more robust predictor of academic performance than conscientiousness. Gender was also found to be a significant predictor of academic performance with female participants scoring a grade boundary above males on average. Social support and self-efficacy, as measured here, had no significant relationship with academic performance, despite previous literature indicating a significant relationship between them and academic performance. This could suggest that these two factors could affect academic performance when moderated or mediated by other variables.

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