



Undergraduate Student Gender, Personality and Academic Confidence

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Abstract: Within a socio-situational and socio-behavioural context, the relationships between the Big Five personality traits and the academic confidence of university students and how they differed by sex of the student was explored. Previous research has identified both Conscientiousness and academic confidence as being linked to university performance. In respect of sex, female students have been found to score higher on all of the Big Five measures, whereas the relationship between sex and academic confidence has been mixed. Using self-report measures of personality and academic confidence from 1523 Spanish students, it was found that the female students were more confident in their Grades, Studying and Attendance components of academic confidence and had higher scores for Conscientiousness, Agreeableness and Neuroticism personality measures. Multiple regression analysis found that personality predicts academic confidence with Conscientiousness being the trait that statistically loaded the most strongly. This research further confirms the validity of the Academic Behavioural Confidence scale, and suggests that measures of personality and especially academic confidence could be usefully used in student support situations to help students acquire the strategies and skills that lead to successful university study. It is suggested that further research in the area needs to include outcome or achievement measures and measures of hypothetical constructs such as personality and academic confidence that go beyond self-report measures.

Keywords: Sex differences; Academic confidence; Personality; University students

1. Introduction

Whether someone is male or female is a highly salient characteristic in our social worlds; one that is used with ease to categorise people (Eagly, Beall & Sternberg, 2004) and from that to make predictions and offer explanations for behaviour. This is well evidenced in the history of the study of sex differences in psychology, in which the review by Maccoby and Jacklin in 1974 was a seminal moment (Leaper, 2011). Maccoby & Jacklin found that whilst there were a small number of reliable gender differences, for example that boys are more aggressive and that girls have higher verbal ability, essentially boys and girls are much more similar than they are different on the majority of psychological variables, a finding that still holds true forty six years later (Leaper, 2011; DiPrete & Buchmann, 2013; Jäncke, 2018). Indeed, Hyde (2005) proposes the Gender Similarities hypothesis arguing from her review of 46 meta-analyses that whilst acknowledging that there are gender differences, these can be age and context specific. However, globally gender differences in life's opportunities and lived experiences are huge, in favour of men and only closing slowly (Gender Report Gap, 2020).

1.1. Gender in Society

Taking a socio-situational approach, gender as a salient characteristic draws attention to the fact that around the world women remain seriously disadvantaged with a gap of almost a third to closing the population weighted average gender difference (Gender Report Gap, 2020). The largest disparity is to be

found in political empowerment, with globally less than a quarter of parliament seats occupied by women. Similarly, in the senior private sector, just over a third of managers and public sector officials are women. In the labour market, over three quarters of the men are in employment as opposed to just over half of the women, made worse by the fact that the earnings of the women are around half that of the men in similar positions. Globally, the education gap between boys and girls has been closing, although 10% of girls between the ages of 15 and 24 remain illiterate. This is seen mainly in developing countries, but even in countries which have closed the gender education gap, it is not clear that the qualifications that the female students leave with are those that are most required for the professions that will be required in the future. Iceland, for example, despite being the most gender equal country in the world for the last 11 years, has still only closed the gender gap by 88%, meaning that it remains gender unequal (Gender Report Gap, 2020).

The neolithic farming revolution in general and plough farming in particular have been linked with creating inequalities for girls and women (Potts & Campbell, 2008; Alesina, Giuliano & Nunn, 2013; Hansen, Jensen & Skovsgaard, 2015), however that is likely to be just a part, even if a substantial part, of the explanation for the persistence of the extensive lack of opportunities for women around the world (Harari, 2014).

Biology has been invoked as an explanation for sex or gender differences (for example, Schmitt, Realo, Voracek & Allik, 2008; Schmitt, Long, McPhearson, O'Brien, Remmert, & Shah, 2017), by invoking the neolithic farming revolution, researchers and theorists are here talking about essentialistic, distal causes as distinct from more constructivist, proximal causes which Wood & Early (2002) synthesised into a biosocial approach to sex differences. From a socio-behavioural perspective, the salience of gender facilitates in-group / out-group formation from which readily flows in-group favouritism and out-group hostility (Tajfel & Turner, 1979; Leaper, 2011). These inter-group dynamics lead the debate into the realm of the influence of peer relationships and self-construal in the construction of gender differences (Tobin et al., 2010; Leaper, 2011), from which the stereotype-threat dynamic can come into play (Steele, 1997; Miller & Halpern, 2014). In a university context these factors will combine to influence the respective approaches of male and female students to each other and to their academic studies.

A socio-linguistic perspective shows that gender is salient through being embedded in language, more extensively in some languages than others but present as an integral part of the grammar in English, for instance through gendered nouns and pronouns (Bigler and Leaper, 2015). Thus language draws attention to gender in situations where it is not necessary. A teacher saying "Good Morning, Boys and Girls" could just as easily have said "Good Morning, Class (or Students or Pupils)". As Bigler (2015) stresses, there is no necessity in drawing attention to the fact that some pupils or students in that the class are girls (or young women) whilst others are boys (or young men).

1.2. Student Gender as an Academic Variable

The salience of the sex of a student has been picked up by Sander and Sanders (2007) who said that their "interest in gender differences in orientation to academic study was prompted by an accumulation of anecdotal data that male and female students seem to behave differently in relation to their academic studies" (p. 33). DiPrete & Buchmann (2013) in the preface to their book, explain how their research on gender differences in education in the United States of America was triggered by their independent observations of the differential success and the need for help of boys and girls in their children's schools. The salience of gender has created an awareness of the differences of boys and girls or young men and women in educational strategies and achievements.

Socio-culturally, the disparity between boys/men and girls/women in education has reduced dramatically, second only to health (Psaki, McCarthy and Mensch, 2018; Global Gender Gap Report 2020). In the United Kingdom, the attainment of female university students now outperforms that of their male counterparts (Adams, 2019). A similar reversal in the education gap has been seen in the United States of America where over half of all college students are women who are also more likely than male students to stay in education, obtain degrees, and postgraduate qualifications, which can be attributed to the better social and behavioural skills in girls which lead to a greater rate of cognitive learning and higher levels of academic investment, as measured by activities such as doing homework tasks (DiPrete & Buchannan, 2013). Farsides & Woodfield (2010) and Sheard (2009) found that what students do in university, especially additional work and activities, was the best predictor of their academic outcome. This positive orientation to academic work

appears to be established early in life, possibly through parental involvement (Gorad, See & Davies, 2012) and shows a gender differential.

Inspection of HESA (Higher Education Statistics Agency) data for 2018/19 shows that 75% of female, UK students, attained a first or an upper-second as opposed to 71% of the male students. Conversely 29% of the male students were awarded a lower second or less against 25% of the female students, which suggests that, whilst at times the salience of gender is an unnecessary distraction that may lead to prejudice and discrimination through categorisation could also be beneficial in drawing attention to inequalities and indeed lost opportunities and human rights.

In Spain, recent data shows that female university students likewise outperform their male counterparts although following graduation their salaries are significantly less (Europapress, 2018). Still in Spain, Costa & Taberner (2012) found, in a sample of secondary school pupils, that the self-concept held by the female students exceeded that of the male students and, most importantly that self-concept was a predictor of academic performance. An extensive report from Eurydice (2009) suggests that the situation in Spain with respect to the gender of university students is comparable to that of the UK.

1.3. Gender and Academic Confidence

Martin & Phillips (2017) show that drawing attention to gender in business settings can have an adverse affect on the confidence of female employees, something that is often associated with being female (Lundeberg, Fox, & Puncoff, 1994; Reuben, Sapienza & Zingales, 2014). However and in contrast, the fact that female students are now outperforming male students in UK universities, arises the possibility that female students have a concomitantly greater confidence than their male counterparts, especially in courses like psychology in which the female students considerably out-number the male students. Sander & Sanders (2009) and Sander, Putwain & de la Fuente (2013) reported sex differences in university students on psychology and healthcare programmes using the Academic Behavioural Confidence (ABC) scale (Sander & Sanders 2009), finding that the male students were more confident in the grades that they attain, in their confidence in studying, and in talking about their studies; which runs counter to the current performance of female students in university education. In line with these findings, Sanders, Sander & Mercer (2009) found that male psychology students had significantly higher self-esteem score than their female counterparts and were significantly more confident of attaining higher grades. However, these findings showing greater confidence in male students, come from relatively small samples a decade ago. Has the confidence of female students in aspects of their university degree as measured by the Academic Behavioural Confidence scale changed, especially as the female students are now more likely to know that they are outperforming male students in the UK's higher education sector since 1992 (Broecke & Hamed, 2008) and in courses where the female students are in majority? One of the aims of this study is to answer that question.

The gender differences in students' performance in higher education could be coming from the way students see themselves as gendered individuals through social comparisons. The female students will know that they are the hard working, diligent, conscientious ones who, over the years have come to achieve better, on average, than the male students. As one male student noted: "It's weird. It happened all through school. They just seem to have a higher drive to, the motivation to work. Not necessarily smarter than boys but their drive to work and keep plugging away it's so, it's more in tune than boys. Boys tend to leave it 'til the last..." (Sanders, Sander & Mercer, 2009, page 9). This difference in verbalising between the male and female students is supported by a substantial literature considering the difference in verbal behaviour between male and female students, particularly in tutorial settings (Read, Archer, and Leathwood 2003; Sommers & Lawrence 1992; Sternglanz & Lyberger-Ficek 1997).

From years of social comparison in school, the female students should show greater confidence in the grades that they can attain, in the studying that they do and in their likelihood to attend taught sessions. Sanders, Sander & Mercer go on to say: "I think they (female students) have a bigger need for order, you know 'cos today we had uh, sort of a lesson today and we, we had to write ideas down and in our group we gave all the writing and the organising to put it down on paper to the girls. 'Cos we knew to be honest they'd be neater. They'd plan it out better (agreement from the other group members) but all the ideas and things to write down came from us, but they could present it really well, but I think we were sort of turning up all the

ideas" (pp.9-10). From this it could be predicted that the male students will show greater verbalising confidence than the female students.

1.4. Gender and Personality

Is the diligent, conscientious, committed nature of female students something that is part of them, part of their personality? Research has shown that the Big Five personality factors: Openness, Conscientiousness, Extraversion and Agreeableness, positively correlate with university academic performance and Neuroticism negatively or poorly (Richardson, Abraham & Bond, 2012; Chen & Schmidt, 2015; Köseoglu, 2016). Conscientiousness has been found to be the strongest predictor, albeit one moderated by the subject of study (Vedel, 2014) and the way in which personality is measured (Vedal & Poropat, 2017). Farsides & Woodfield (2010) found that the personality trait of openness, along with learning as a motive for being at university and in doing formative exercises and activities to be the biggest predictors of student achievement, the latter supported by Sheard (2009). Gender differences were found in openness, agreeableness, and neuroticism, but Farsides & Woodfield (2010) concluded that what students do whilst at university, activities such as doing formative work that does not contribute to their overall degree performance is more important than individual differences between students upon arrival in determining their eventual undergraduate academic success. This leads to the prediction that the Big Five personality trait of Conscientiousness should be more predominant in the female students than in the male students, as this could be a driver of the commitment (Sheard, 2009), motives and learning activities (Farsides & Woodfield, 2010) that underpin higher achievement in university studies. A student's gender may be associated with those and other attributes of successful university study, but gender per se is not causal.

1.5. Aims and Hypotheses

From the theory and research presented, it can be predicted that the Big Five traits of openness, conscientiousness, extraversion, and agreeableness, should be positively correlated with students' academic confidence as measured through the Academic Behavioural Confidence scale and neuroticism should be negatively correlated. The female students should have higher scores in all measures. Finally, it can be predicted that personality should have a causal link to academic confidence being a more general trait.

In summary, the objective of this research is to test the three hypotheses as presented below, which operationalise an analysis of the relationships between the Big Five personality traits and the four sub-scale measures of academic confidence of university students using data from two validated psychometric measures. At the same time, the research seeks to identify any gender differences that might arise in personality and academic confidence. From this, any influence of gender and personality of undergraduate students will be established.

1. There will be a difference in the Academic Behavioural Confidence sub-scales of Grades, Verbalising, Studying, and Attendance and in the Big Five traits of Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism between male and female students.

2. The Big Five traits of Openness, Conscientiousness, Extraversion, and Agreeableness will positively correlate with the Academic Behavioural Confidence sub-scales. The Big Five trait of Neuroticism will negatively correlate with Academic Behavioural Confidence.

3. Academic Behavioural Confidence will be predicted from Sex, Conscientiousness, Openness, Neuroticism, Extraversion and Agreeableness.

2. Method

2.1. Participants

The sample comprised undergraduate students enrolled in Psychology, Primary Education, or Educational Psychology degree programmes from two universities in Spain. The data used here comes from two different data sets, the first with data collected between 2012 and 2014 and the second from 2015 to 2018. Both of these data sets had in common the variables sex, age, and academic confidence, but only the more recent dataset included personality measures. The data collection process was the same in both datasets as were the degree courses and the universities. The participants' ages in years and sex are shown in table 1 along with the relevant variables that were measured and thus had values in the data sets. In completing the

psychometric scales, students were asked, amongst other demographic questions whether they were male or female without differentiating between the very different constructs of sex and gender. As The UK's Office For National Statistics (2019) says, these terms are often used interchangeably and that is the sense in which they are used here. There was no attempt to differentiate at the data gathering stage, and the variable was labelled sex but much of the literature talks about gender. In the context of this article, the terms are interchangeable unless otherwise stated.

Table 1.

Participant profile for the two component data sets.

Data set	Sex		Age (years)				Variable Measures in Data Set
	Male	Female	Mean	Min	Max	SD	
2012-14	386	1020	23.05	18	51	4.49	Sex, Academic Confidence
2015-18	83	301	21.61	17	58	5.42	Sex, Academic Confidence, Personality
Total	469	1321					
Total students with known sex	1790						

Differences between male and female participants for academic confidence were calculated from an aggregate data set ($n=1838$) in which 48 participants failed to record their sex whereas sex differences for personality come solely from the second, more recent data set as do the correlations between personality and academic confidence. Whilst acknowledging that it would be preferable to have roughly equal numbers of male and female students for a consideration of sex differences in personality and academic confidence, the proportion of female to male and the age profile of the participants matches the profile of student cohorts on the degrees onto which they were enrolled and is therefore representative of students on such programmes.

2.2. Instruments

Big Five Questionnaire (BFQ, Carrasco, Holgado & Del Barrio, 2005) used to measure personality was based on a version by Barbaranelli et al. (2003) which was adapted and revalidated for young university students (de la Fuente, 2014a). The scale contains 67 statements and previous Confirmatory Analysis (CFA) reproduced a penta-factorial structure corresponding to the Model of the Big Five (de la Fuente et al., 2020). The results have shown adequate psychometric properties and acceptable adjustment rates. The confirmatory model second order showed a good fit [Chi-square = 38.273; Degrees of freedom (20–15) = 5; $p < 0.001$; Normed Fit Index, NFI = 0.939; Relative Fix Index, RFI = 0.917; Incremental Fix Index, IFI = 0.947; Tucker-Lewis Index TLI = 0.937, Comparative Fit Index, CFI = 0.946; Root Mean Square Error of Approximation, RMSEA = 0.065; HOELTER index = 2453 ($p < 0.05$) and, 617 ($p < 0.01$)], and the internal consistency of the total Scale is good (Alpha = 0.956; Part 1 = 0.932, Part 2 = 0.832; Spearman-Brown = 0.962; Guttman = 0.932).

Academic Confidence was measured by the 24 item Academic Behavioural Confidence (ABC) Scale in a Spanish validated version (Sander, et al., 2011). The ABC scale is a psychometric measure of the confidence of undergraduate students in their anticipated study related behaviours on a largely lecture-based course. The scale items in English and Spanish can be found as the appendix to Sander et al, (2011). Previous work has shown a four-factor model (confidence in attaining grades, studying, attending classes, and discussing course material) with adequate reliability and validity (Nicholson et al., 2012; Sander & Sanders, 2009; Sander, et al., 2011). The scale requires students to respond to a question stem ('How confident are you that you will be

able to...') on a five-point scale (1 = 'not at all confident', 5 = 'very confident') for items such as '...manage your workload to meet coursework deadlines' and '...write in an appropriate academic style'. A higher score therefore indicates greater confidence in self-efficacious study skills or behaviours. Table 2 maps the scale items onto the sub-scales of the Academic behavioural Confidence scale and records the internal reliability of each.

Table 2.

Internal reliability of the 4 factors of the Academic Behavioural Confidence scale.

Scale	Scale items	Scale Internal Reliability	
		Cronbach's alpha	McDonald's ω
Grades	2, 7, 15, 16, 20, 23	0.815	0.815
Studying	1, 4, 21, 22	0.703	0.710
Verbalising	3, 5, 8, 10	0.827	0.834
Attendance	6, 18, 24	0.197	0.289
	6, 18	0.625	0.623

The internal reliability measures for the sub scales Grades and Verbalising are good and that for Studying, is acceptable. The alpha value of .625 for a reduced Attendance scale seems poor but as Field (2018) points out, the size of alpha is dependent also on the number of items in the scale. The more items there are, the higher alpha is likely to be, so with just two items, one could expect a low alpha value. The absolute correlation between items 6 and 18 is .458. Thus the Attendance scale is seen as acceptable. Item 24 was a very specific item, Attend Tutorials which was largely not applicable to those Spanish students. The McDonald's ω coefficients match those of Cronbach's alpha.

Confirmatory factor analysis was performed to validate the four sub-scale structure of the Academic Behavioural Confidence scale as shown in table 2 but with item 24 deleted as out of the 1838 participants, only 424 gave an estimate of their confidence. Item 24 in the ABC scale is unique in that it asks specifically for confidence in attending tutorials and increasingly courses do not offer traditional tutorials but rather seminar or workshop sessions or even drop-in sessions. The renaming items in this scale, 6-Attend most taught sessions and 18-Be on time for lectures, would seem both statistically and with face validity to cover this possibility. The resultant fit statistics (see table 4) were supportive of the four sub scale structure.

Table 3.

The fit statistics for confirmatory factor analysis of the 4 factor structure of the Academic Behavioural Confidence scale.

Chi-Squared	759.414
DF	98
RMSEA	0.061
CFI	0.935
TLI	0.921
SRMR	0.045

2.3. Procedure

Participants voluntarily completed the scales voluntarily in Spanish using an online platform (de la Fuente et al. 2015) [<http://www.estres.investigacion-psicopedagogica.com/english/seccion.php?idseccion=1>].

All students gave their informed consent through an online signature that is required when creating an account on the platform, before any questionnaires are completed. A range of specific teaching-learning processes were evaluated, covering different university subjects over a two-year period and these included the scales in question here. To avoid fatigue, students were invited to complete only one questionnaire at two different times of each week, during a semester. For their participation they were provided with a Certificate of Participation in Research as an incentive to maintain motivation and recognise the effort. In the Spanish speaking world, such certificates can be very beneficial to students alongside their CV. The procedure was approved by the respective Ethics Committees of the two universities in the context of two R & D Projects.

2.4. Data Analysis

Pearson Correlation Bivariate correlations explored the relationship between personality and academic confidence. Student t-tests were used to test for differences between the male and female students for the five personality traits and the four academic confidence sub-scales. Finally, multiple regression was used to model the affect of personality on academic confidence. All of these analyses were conducted in SPSS (v.26).

Confirmatory factor analysis was used to provide evidence of the factorial validity of the Academic behavioural Confidence scale. Model fit was assessed in Onyx (von Oertzen, Brandmaier & Tsang, 2015) by examining the chi-square to degrees of freedom ratio, the Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) which, for a good model fit, should be greater than .90 and the RMSEA statistic with a value less than .06 (Schumaker & Lomax, 2010; Hoyle, 2011). Scale reliability was assessed using Cronbach's Alpha in SPSS (v.26) and McDonald's ω in JASP.

3. Results

3.1. Sex Differences in Academic Confidence and Personality

This first section of the results addresses hypothesis 1. Using the combined data set reduced to include just those students who had completed the academic confidence scale, the differences in scores between the male students and the female students were assessed. The means presented in table 4 show the female students as more confident in their grades, in studying, and in attending, but less confident than the male students in verbalising. All of these differences are statistically significant with small effect sizes with the exception of the effect size associated with the difference between male and female students in verbalising which is a medium effect size.

Table 5 reports the differences between male and female students in each of the 5 personality measures from the data from the smaller, more recent dataset as the only one that collected personality measures. Table 5 shows that there are statistically significant differences between the male and female students for the traits: conscientiousness, neuroticism, and agreeableness, all with a small effect size. Specifically, the female students show higher scores for all three traits.

In both tables 4 and 5, the effect size shown is Hedges' g as it corrects for different sample sizes as present here. In each of tables 4 and 5 multiple comparisons are being made meaning that a Bonferroni correction is needed. With an adjusted alpha of .01 all differences shown remain significant. Taking this adjusted alpha value of .01 and applying the Benjamini–Hochberg (BH) procedure, these differences remain significant (Glen, 2015). The BH-adjusted p values are shown in tables 4 and 5.

Table 4.
Means and standard deviations for each of the academic confidence sub-scales by sex of student.

		Academic Behavioural Confidence			
		Grades	Studying	Verbalising	Attendance
Male n=469	Mean	3.93	3.73	3.32	4.17
	SD	.65	.71	.90	.88
Female n=1321	Mean	4.02	3.91	3.03	4.34
	SD	.63	.69	.95	.83
t-test, df, p		2.65, 1788, .008*	4.90, 1788, .0005*	5.79, 1788, .0005*	3.73, 1788, .0005*
BH Adjusted p		0.0175	0.0075	0.0075	0.0075
Effect size, Hedges' g		0.14	0.26	0.31	0.20

*Difference is significant at the 0.01 level (2-tailed) with a Bonferroni correction for multiple comparisons

Table 5.
Means and standard deviations for each of the academic confidence sub-scales by sex of student.

		Extraversion	Conscientiousness	Neuroticism	Agreeableness	Openness
Male n=113	Mean	3.66	3.50	2.42	3.81	3.51
	SD	.57	.59	.66	.55	.55
Female n=414	Mean	3.61	3.74	2.64	4.02	3.51
	SD	.57	.59	.66	.48	.48
t-test, df, p		ns	3.65, 498, .0005*	3.13, 503, .002*	3.85, 494, .0005*	ns
BH Adjusted p			0.0075	0.015	0.0075	
Effect size, Hedges' g			0.41	0.33	0.42	

*Difference is significant at the 0.01 level (2-tailed) with a Bonferroni correction for multiple comparisons

3.2. Correlations between academic confidence sub-scales and the Big Five personality traits

Table 6 presents the correlations between the students personality and academic confidence regardless of sex. It was proposed in the second hypothesis, that the Big Five traits of Openness, Conscientiousness, Extraversion, and Agreeableness, would positively correlate with the Academic Behavioural Confidence sub-scales. The Big Five trait of Neuroticism will negatively correlate with Academic Behavioural Confidence.

Table 6.*Correlation coefficients for the personality factors and the academic confidence sub-scales.*

	Academic Confidence			
	Grades	Studying	Verbalising	Attendance
Extraversion	0.215**	0.226**	0.342**	0.003
Conscientiousness	0.525**	0.623**	0.221**	0.411**
Neuroticism	-0.172**	-0.142**	-0.175**	-0.117**
Agreeableness	0.278**	0.307**	0.171**	0.238**
Openness	0.338**	0.33**	0.353**	0.102*

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

It can be seen in table 6 that there are statistically significant correlations between each of the five personality measures and the 4 academic confidence measures, and that these are positive with the exception of the correlations between the neuroticism and all the academic confidence measures which are all negative. Notable in these results are the magnitudes of some of the correlation coefficients. Specifically, (i) the correlations between extraversion and verbalising (.342) ; (ii) conscientiousness and grades (.525), studying (.623) and attendance (.411) and finally (iii) openness with grades (.338), studying (.33) and verbalising (.353).

3.3. Level of Academic Confidence from Sex and Personality

In respect of the third hypothesis, multiple regression analysis was performed to explore the impact of sex of the student and their personality as measured by: conscientiousness, openness, neuroticism, extraversion, and agreeableness on each of the four sub-scales of the academic behavioural confidence scale. The results of these linear regression analyses are shown in Table 7, where it can be seen that each of the four models, one for each of the academic confidence sub-scales, is significant. The adjusted R squared values (R^2) suggest that the academic confidence sub-scale Studying is most affected by sex of the student and their personality profile. Of the five personality traits, conscientiousness and openness have the greatest significant impact across all measures of academic confident with the magnitude of the standardised beta coefficients for the personality trait, conscientiousness being notable as is the consistent negative loading of the trait neuroticism. In none of the fours models is Sex itself was not a significant contributor to any of the academic behavioural confidence sub-scales but its inclusion moderated the effect of the individual personality variables. This was seen by the sequential inclusion of the personality variables in a regression model that started with just gender. The personality variables were entered in order of increasing correlation coefficient with the relevant ABC sub-scale. For example, for the ABC sib-scales Grades and Studying as dependent variables, Sex remained a significant weight until the inclusion of the personality trait Conscientiousness.

Table 7.
Regression analysis of sex and personality on academic confidence by sub-scale

	Academic Behavioural Confidence			
	Grades	Studying	Verbalising	Attendance
F-Value, df: (6, 426)	28.843**	42.963**	16.971**	18.084**
R ²	0.279	0.368	0.182	0.192
Standardised Beta Coefficients				
Personality Trait				
Openness	0.106*	0.041	.256*	-0.132*
Conscientiousness	0.452*	0.587*	0.067	0.464*
Extraversion	-0.058	-0.040	0.209*	-0.190*
Agreeableness	0.003	0.001	-0.086	0.139*
Neuroticism	-0.110	-0.046	-0.113	-0.001
Sex	0.076	0.051	-0.088	-0.023

* Significant at p<.05

** Significant at p<.0005

In summary, the results have shown that personality and academic confidence were correlated as predicted, and that the female students were more confident in each of the academic confidence measures with the exception of verbalising. The female students also had higher levels of the personality measures of conscientiousness, agreeableness, and neuroticism. Finally, the regression analyses show that each of the sub-scales of academic behavioural confidence may be predicted from the sex and personality profile of the student, with the greatest impact being the personality trait of conscientiousness on the academic confidence measure of studying.

4. Discussion

Three hypotheses were put forward which will be examined in turn. For the first, there will be a sex difference in Academic Behavioural Confidence and in the Big Five personality measures, considerable differences were found. There were significant differences in the ABC scores for each of the four sub scales, with the female students showing higher levels of confidence in their Grades, Studying, and Attendance, as predicted. Also as predicted, the male students were more confident than the female students in their Verbalising skills. This difference had a medium effect size, whilst the others were all small but that is still one in which there is a real effect (Walker, 2007-8). Although these findings conflict with previous sex difference results using the Academic Behavioural Confidence scale (Sander & Sanders, 2009; Sanders, Sander & Mercer, 2009), the research presented here has used a much larger sample size. With this substantial methodological improvement it is suggested that note has to be taken of the findings in gender differences presented here, which also alignment with the research findings presented in the introduction.

For the Big Five measures there were significant differences between male and female students' trait scores for Conscientiousness, Neuroticism, and Agreeableness, with medium effect sizes, which are in line with Mac Giolla & Kajonius (2019) and Schmitt,et al., (2008). The traits of Extraversion and Openness showed no significant difference, whereas Mac Giolla & Kajonius (2019) also found women scored higher

than men for the traits of Extraversion and Openness, and Schmitt et al (2008) reported higher levels of Openness. Both of these studies (Schmitt et al., 2008; Mac Giolla & Kajonius, 2019) were exploring the relationship between gender differences in personality around the world, and the gender equality index of the country, finding that as gender equality increases so does gender difference in the Big Five measures. With the data reported in this study coming from Spanish undergraduate students and Spain ranking 8th in the Global Gender Gap Index 2020 rankings (Global Gender Gap Report, 2020), gender differences in personality are to be expected and were found.

The second hypothesis predicted a positive correlation between the Big Five traits of Openness, Conscientiousness, Extraversion, and Agreeableness and the Academic Behavioural Confidence sub-scales with the correlations being positive with the exception of Neuroticism, which would negatively correlate with Academic Behavioural Confidence. The findings were that Extraversion positively correlated with the ABC sub-scales apart from Attendance. Conscientiousness positively correlated with all four ABC sub-scales and with correlation coefficients that are surprisingly high for research in the social sciences (McAdams, 1994), with the exception of the relationship with verbalising. Neuroticism correlated negatively, but lowly with all the ABC sub-scales as predicted, Agreeableness and Openness correlated significantly and positively. Given the relatively large sample size of 527 for those calculations, small but significant correlations are not a surprise, but the magnitude of the positive correlation between Conscientiousness and the ABC sub-scales of Grades, Studying and Attendance, are noteworthy and in line with previous findings on the importance of high conscientiousness scores and academic achievement in university (Vedel, 2014; Richardson, Abraham & Bond, 2012; Chen & Schmidt, 2015; Köseoglu, 2016). It could also be posited that the doing of formative exercises that Farsides and Woodfield (2010) and Sheard (2009) found to predict academic success, are the hallmark of the Conscientious student as is going to university with the intention to learn (Farsides & Woodfield, 2010). Thus the findings reported here are in line with those from previous research and help, if only in a small way, to build a profile of the typical, successful university student. Finally, and driven by the third hypothesis, personality was found to be a predictor of overall academic confidence, with Conscientiousness being one of the three Big Five traits that statistically added to that prediction. Conscientiousness had, by far, the biggest impact on academic confidence as shown through the correlations and the regression analysis. The differences in the academic confidence and personality measures between the male and female students were small but as predicted from previous research. Whilst gender does not significant weight on any of the four academic behavioural confidence sub-scales in the regression analyses, its impact being over-shadowed by the impact of the personality variables, it is, nonetheless a variable that has to be considered in the educational processes.

In specific relation to students, teachers and day to day education, the results make some suggestions for guiding the dynamic of the teaching and learning process. The data shows that female students are more confident of obtaining higher grades, of doing the necessary study to achieve them and of attending classes but they are less confident than their male peers in talking about their studies. In respect of their personality the female students are more conscientious, more agreeable but have higher neuroticism scores. Thus the female students are not uniformly better in their orientation to either studies than the male students but across the board have more qualities and strategies than the male students that will lead to higher levels of academic achievement. This raises a number of questions: Firstly, should the female students be encouraged to talk more about their subject of study with academic staff in tutorials, seminars, lectures and other conversations and should they be encouraged to worry less, to embrace fewer of the symptoms of neuroticisms that their outscore the male students on? Secondly, should time, effort and attention be given to the male students to support them to orient towards their academic studies in a way comparable to their female counterparts? Thirdly, the results show that whilst gender on its own does have an effect on both personality and academic confidence, when put into regression models, the effect of gender is removed, sooner or later, by personality variables, in particular conscientiousness and openness. However, personality itself is not malleable, certainly over the short term, within an educational establishment, even if it does support the findings of Gorard (2012) that the home environment and in particular the support that it offers is the biggest single predictor of school level educational achievement. Thus whilst an overall political goal might be to stimulate parents and other significant adults to support, encourage and guide young people's education, regardless of their gender, it is not a level of analysis that is going to help the educator with a group of students. At that level, the answer to the first of the questions posed above might be that yes, female students would be encouraged, guided and supported in talking more about the study of their subject and to worry less about it. Similarly, the answer to the second question could be yes, male students should be explicitly encouraged, guided and supported to be

more like their female counterparts in the approach they take to their studies, doing what is necessary to be confident that they will get good grades, confident in their study behaviours and in attendance of scheduled sessions to which might be added and in also doing other, additional, formative. Thus the results offer clear guidance for teachers and those who support students in general in universities and maybe elsewhere, in how best to work with a student's gender in support of academic achievements.

Taken together, the female students were more confident in their Grades, Studying, and Attendance, arguably the profile of a good student from a teacher's perspective, and a profile that could lead the student to do those extra, additional, set activities (Farsides & Woodfield, 20017; Sheard, 2009). The female students had higher scores for Conscientiousness, Agreeableness, and Neuroticism; and, as already noted, Conscientiousness is known to be a reliable predictor of academic success (Richardson, Abraham & Bond, 2012; Vedel, 2014).

The findings presented here are important, not just because they substantiate a range of previous research in the area of sex difference in personality and confidence in educational settings, but because they help to build a profile of achievement in higher education, which can be used by personal tutors and other academic support systems in higher education to guide the development of key skills in students. They support a socio-situational and a socio-behavioural approach to gender differences in education, arguing that both, distally and proximally the environment, and especially, the social environment, creates the conditions for female students to come to see themselves as successful and, through social categorisation, see themselves as having better, more successful and thorough strategies and behaviours for achieving in higher education. To fully understand the processes involved in students' emergence as successful learners, one has to look behind the proxy measures of personality and academic confidence to the socio-situational factors that set young people on a pathway to success in education and why, perhaps through stereotype threats (Miller & Halpern, 2014), that is more likely to happen for girls and young women in education than for boys and young men. This is a very important area to explore further. The findings presented here are also important as they offer a way, just a very small way admittedly, to address the gender gap that exists across the world. Our female students should be celebrated for their successes and used as role models.

Limitations

The Big Five trait of Conscientiousness as a hypothetical construct, cannot be considered truly causal per se in determining the successful study behaviour of students. The same applies to academic confidence. These traits are more likely to be proxies for something situational that created the behavioural characteristics of conscientiousness, any genetic contribution to personality aside. One possible candidate is parental involvement in children's education, which Gorad, See & Davies (2012) found from an extensive review, to be the strongest of a wide range of measures that predicted academic school performance. The extent to which parental involvement remains a prime influencer of academic attainment at university is an avenue for future research, but to speculate, one can see how the appropriate support and encouragement of children by their parents during their school years, could lay the foundations and pave the way for a commitment to education that could be encapsulated in the hypothetical constructs of Conscientiousness and Academic Confidence. In short, the focus needs to be on the social environments constructed for boys and girls as they grow up with particular attention paid to culture and social stereotypes (Jäncke, 2018).

Other areas prime for future research in this area include measures of actual academic achievement. The inclusion of other-report measures, in addition to self-report measures of variables such as personality and academic confidence (Vedel (2014) should also be considered. That all of these are absent in the research considered here is drawback to this research. Finally, it would also be wise to follow Weisberg, Deyoung, & Hirsh (2011) and measure the Big Five traits at the aspect level in order to follow more carefully the gender differences in personality characteristics that may be lost at the macro level of five traits.

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