THE USEFULNESS OF THE ATAR AS A MEASURE OF ACADEMIC ACHIEVEMENT AND POTENTIAL

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Anthony Manny, Helen Tam and Robert Lipka

1 WHY THE ATAR WORKS

Recent research by UAC shows that the ATAR is the best available predictor of university success, as measured by students' first-year grade-point-average (GPA). The higher the ATAR, the higher the student's first-year GPA is likely to be.

Further, the ATAR is related to the likelihood of obtaining a failing first-year GPA (defined as less than 4). The higher the ATAR, the less likely the student would get a failing first-year GPA. For example, in our recent study, we found that for students with an ATAR in the 90s, only 8 per cent had a first-year GPA of less than 4. This rate increases as ATAR decreases, such that for students with ATARs in the 70s, 29 per cent would have a failing GPA, and for students with ATARs in the 50s, around half (52 per cent) would have a failing GPA.

Our findings are consistent with other research by the Grattan Institute[1] showing the value of the ATAR in predicting success at university. As with all predictors, the ATAR is not perfect. There will be instances where the prediction will 'miss the mark'. Also, there will be cases where selection based on the ATAR alone would not be optimal. However, this has been acknowledged by institutions for a long time and they have been using alternative mechanisms for selecting students to certain courses like design and the performing arts.

However, for a large number of courses where the fundamental requirement of the student is to possess the right level of academic ability to meet the demands of the course, the ATAR is an effective tool in predicting the likelihood of this outcome.

1.1 Defining success

Success at university can be defined in many ways. First-year university results are a useful way to define success due to the timeliness and availability of the associated data, and have been found to correlate with degree completion rates[1]. Many factors influence results in later years of university ranging from personal life circumstances to subject specialisation, which are less related to secondary study choices. For the purposes of this report, first-year success was primarily measured by first-year grade point average[2] (GPA) and defined by four outcomes:

- incomplete first year – achieving a GPA of zero with a non-zero study load (recording a fail for all subjects)
- GPA under 4 – the student has failed one or more subjects
- completed first year with fails – recording a non-zero GPA but failing at least one subject
- completed first year with no fails – achieved a pass grade or better in all subjects.

1.2 Analysis

A summary of first-year university outcomes (as defined in section 1.1 above) is shown in Figure 1 below for HSC students (2013–17) enrolling through UAC in a bachelor degree (2014–18). On average, over half of the students with an ATAR of 60 or above, pass all subjects in first year. This is reflected in the first-year GPA, which has a moderately strong correlation to ATAR.

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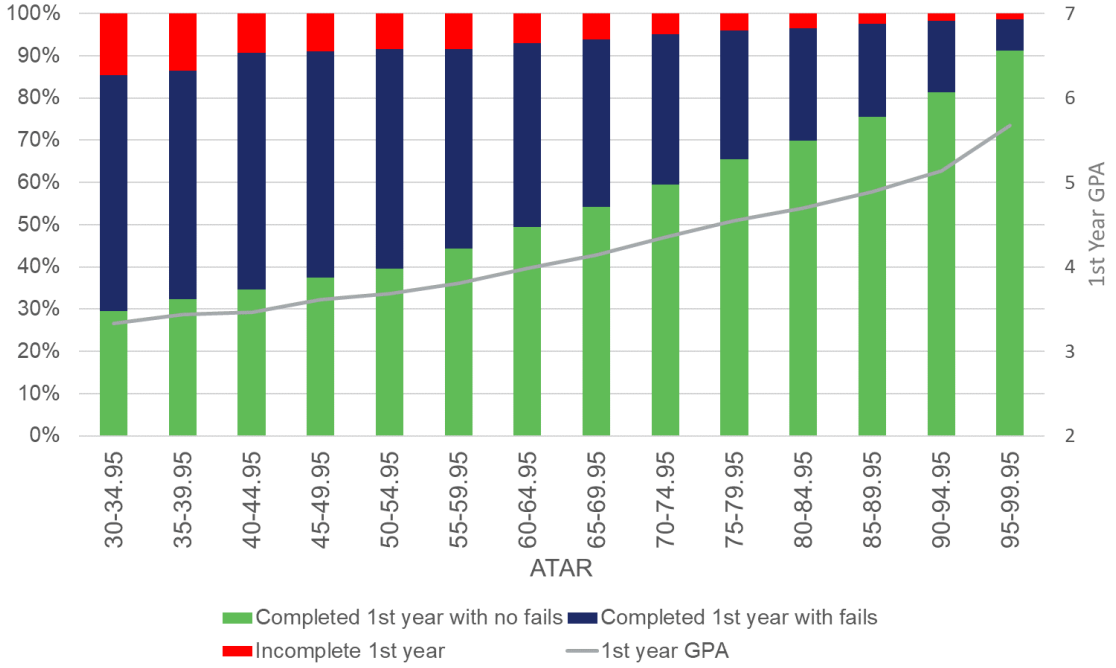
[1] Norton, A., Cherastidtham, I., & Mackey, W. (2018). Dropping out: The benefits and costs of trying university. Grattan Institute.

[2] https://www.uac.edu.au/future-applicants/admission-criteria/tertiary-qualifications

Figure 1: First-year outcomes of HSC students 2013–2017.



1.3 The strengths of the ATAR

One of the strengths of the ATAR, as a tool for university entry, is that it is broad. There is no university degree from which you can graduate having studied only one subject, so to be prepared for university it's important to have achieved in a variety of areas.

ATAR is a single number, but it has been calculated using many inputs. Student's school assessment results over the senior school years make up half of the marks for each subject, with the other half coming from the HSC exam taken at the end of Year 12. The ATAR is also based on 10 units of the student's studies. Apart from the compulsory two units of English, the other eight units come from the remaining subjects where the student has excelled in.

In this way, the ATAR is the best summation of a student's achievements from senior secondary schooling. Because the ATAR is calculated based on achievements, rather than say, an aptitude test, it is a measure of both ability and effort. The level of achievement obtained by the student would be influenced, of course, by their underlying ability for that subject, but achievement would also be affected by the amount of effort invested, as well as factors such as the student's motivation, attitudes and strategies towards learning. All these factors will determine how well the student will perform in their school assessments and HSC exams, and in turn, these factors will be captured within the ATAR measure.

1.4 The relationship between HSC subjects, KLAs and the ATAR

Another interesting finding from our research is that, while it's important that students study a variety of subjects, there is a strong correlation between performance in one key learning area (KLA) and performance in a different KLA. The correlations among marks from the same student are high and positive.

One finding from our research was that the correlations among marks from the same student are high and positive. This means that the level of performance is fairly even across all subjects for any particular student.

Even between subjects where their contents seem to have little in common, we found strong positive relationships between their marks. For example, students who did both Chemistry and Economics, the correlation between their HSC marks in those two subjects was strong, at +0.8.

The correlation was of the same magnitude between Chemistry and PDHPE, and between Chemistry and Italian Beginners. All these subjects – Economics, PDHPE, Italian Beginners, are all from a different key learning area to Chemistry, and yet there is a strong association in the performance of students doing these combinations of subjects.

This strong relationship in students' performance across subjects is found throughout all HSC key learning areas, and it supports the notion that students' academic ability can be demonstrated in different subjects, even when the subjects appear to be very diverse in their contents.

1.4.1 Analysis

Standard Pearson correlation coefficients were calculated between HSC subject marks from the various KLAs for the same year and for the same ATAR eligible (2013–17) HSC student (Table 1 below).

Correlations of HSC subject marks between KLAs range from 0.39 for Mathematics with Creative Arts, to 0.90 for Mathematics with Mathematics; these are medium and large effect sizes, respectively. These correlations confirm that, on average, student performance in HSC subjects and across KLAs is uneven – and strong performance in one area is associated with similar performance more strongly in some areas than others; however, this association is always at or above medium effect size. Furthermore, as shown in Table 1, the patterns of strongest correlations are different for each KLA.

This result reinforces the importance of students selecting HSC subjects and specialising in areas that fit the student's demonstrated strengths because, overall, results are affected by the combination of subjects; however, there is no single optimal set of subjects for all students. Whether students who study subjects from more closely correlated KLAs achieve better overall results is one potential area for further research.

Table 1: Correlations between HSC subject marks from Key Learning Areas 2013–17.

HSC marks correlations	Creative Arts	English	HSIE	Languages	Mathematics	PDHPE	Science	Technologies
Creative Arts	0.65	0.56	0.51	0.51	0.39	0.44	0.40	0.59
English	0.56	0.69	0.81	0.60	0.67	0.78	0.71	0.63
HSIE	0.51	0.81	0.79	0.54	0.64	0.79	0.68	0.68
Languages	0.51	0.60	0.54	0.65	0.52	0.47	0.48	0.42
Mathematics	0.39	0.67	0.64	0.52	0.90	0.58	0.66	0.56
PDHPE	0.44	0.78	0.79	0.47	0.58	0.87	0.72	0.77
Science	0.40	0.71	0.68	0.48	0.66	0.72	0.75	0.56
Technologies	0.59	0.63	0.68	0.42	0.56	0.77	0.56	0.71

1.5 Flexible by international standards

The ATAR is often criticised for being very different to the measures used by other countries.

It is important to note that Australia is also unique in the diversity of the senior secondary curriculum offered to students. To be eligible for an ATAR, NSW students can choose from over 100 different HSC subjects. This flexibility is not common in other countries. Most countries tend to stream students into a fixed group of subjects, such as the 'arts/humanities' versus the 'science/technology' streams. Some countries such as the US use aptitude tests, which as we've argued, only measures ability but not effort. The UK's A-levels offer a large range of subjects for students, but their admissions rely on other inputs such as interviews, which are not immune to bias and are time-consuming to administer.

In whatever country, under whatever admissions system, the ultimate decision is a binary one, whether the student should be admitted into a course – yes or no.

In this sense, Australia is a world-leader in having a method to rank their students in a transparent, objective and efficient way, while accounting for differences in the combination of subjects students are taking. Shouldn't this be celebrated?

1.6 Broader picture

UAC acknowledges that the ATAR is not a perfect measure of the 'whole student' and it is fair and appropriate that universities use other measures in conjunction with ATAR in order to admit students.

The ATAR is an efficient and effective measure of academic achievement and potential but it does not consider equity issues and says nothing about a student's life goals, passions and broader personality, beyond being resilient, motivated and organised enough to have achieved the HSC.

What's missing in the current debate about ATAR is balance. There needs to be an acknowledgement that ATAR does well in measuring academic ability, and as universities are inherently academic institutions, this cannot be disregarded as unimportant. It's an important part of a much broader and more nuanced admissions landscape.