

RESEARCH PAPER:

Predicting University Grades with the Watson-Glaser™ III and Core Abilities Assessment

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Introduction

The Watson-Glaser™ Critical Thinking Appraisal III (W-G III) is a test of critical thinking and reasoning. Critical thinking can be defined as the ability to identify and analyse problems as well as seek and evaluate relevant information in order to reach a logical conclusion.

The Core Abilities Assessment measures an individual's verbal, numerical, and abstract reasoning skills. One's score on this assessment provides insight into their ability to learn and perform both during education and on the job.

Challenge

A Japanese university sought to improve their process for admitting students into their Bachelor of Business Administration (BBA) and Bachelor of Social Sciences (BSocSc) degrees. Their system for screening and admitting students required a considerable amount of time and effort from staff and they needed a more efficient method to screen students.

Solution

To improve the university's selection process, TalentLens conducted a validation study using the W-G III and Core Abilities Assessments. This study examined how well the two assessments correlated with student grades in the two degrees.

For this study, 145 students completed the two assessments in English. Scores on these assessments were correlated with students' grade point average (GPA) and then corrected for range restriction¹.

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U.S. Department of Labour Validity Guidelines

<.11	=	Unlikely to be useful
.11 - .20	=	Depends on the circumstances
.21 - .35	=	Likely to be useful
> .35	=	Very beneficial

Figure 1. The U.S. Department of Labor provides guidelines for interpreting the validity coefficients of a test. These results show that, when corrected for range-restriction, the W-G III and Core Abilities both far exceed the "Very beneficial" mark for predicting student GPA.

Result

As can be seen in Table 1, the W-G III and Core Abilities Assessments showed correlations of .39 and .30, respectively with student GPA. When corrected for range restriction, the W-G III and Core Abilities correlations increased to .67 and .46, respectively. Using the U.S. Department of Labour's guidelines in Figure 1, both assessments can be considered "Very beneficial" for predicting students' grades.

Validity Results	Correlation with GPA	
	Uncorrected	Corrected
Watson-Glaser Critical Thinking Appraisal III	.39	.67
Core Abilities Assessment	.30	.46
Combined	.42	

Table 1. W-G III and Core Abilities overall correlation results.

Combining Assessments

Combined, the assessments are better able to predict student grades. Multiple regression analyses show that the combined assessment scores have an uncorrected correlation of .42 with student GPA. Effectively, adding the Core Abilities Assessment to the W-G III lead to an 8% increase in validity.

Comparing Degrees

Table 2 shows the predictive validity of the assessments with each degree. As can be seen, Core Abilities is a better predictor of BSocSc than BBA grades, while the reverse is true for the W-G III. Overall the W-G III is a stronger predictor of grades than the Core Abilities Assessment.

Validity Results	Correlation with GPA	
	BBA	BSocSc
Watson-Glaser™ Critical Thinking Appraisal III	.43	.34
Core Abilities Assessment	.27	.32

Table 2. assessment correlations with BBA and BSocSc degrees.

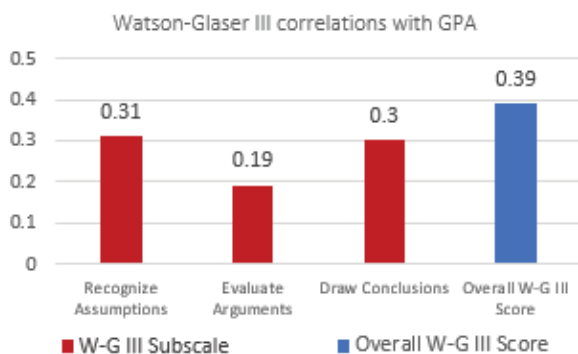


Figure 2. W-G III Correlations with GPA. The 3 red bars denote the 3 W-G III subscales and the blue bar denotes the overall W-G III score.

The Watson-Glaser III in-depth

The Watson-Glaser III is made up of three subscales that underlie critical reasoning:

- 1) Recognise assumptions
- 2) Evaluate arguments
- 3) Draw conclusions

In order to help identify why the W-G III was so predictive of GPA, TalentLens examined the relationship between grades and these individual subscales. Figure 2 shows the subscale correlations with grade-point average. For these students, their ability to recognize assumptions and draw conclusions were most impactful for success in university.

1. This study was conducted to help the university screen students for admission. However, as university GPA was the main outcome measure for this study, only students who were already accepted to the university could be assessed. Using university GPA effectively restricted the range of candidates that could be included in the study because those who were rejected by the university could not be assessed. This range restriction often underestimates correlations. Corrections for range restriction help provide a more accurate estimate of the true correlation.
2. Burton, N. W., & Ramist, L. (2001). Predicting success in college: SAT studies of classes graduating since 1980. The College Board Research Report, 2001–2002. New York: College entrance Examination Board.
3. Kuncel, N. R., Hezlett, S. A., & Ones, D. S. (2001). A comprehensive meta-analysis of the predictive validity of the graduate record examinations: Implications for graduate student selection and performance. *Psychological Bulletin*, 127, 162–181.

Implementing the Watson-Glaser III and Core Abilities in Education

One of the main goals for the university was to use the W-G III and Core Abilities Assessments to assist with screening student applications. To that end, TalentLens researchers worked with the university to identify a precise cut-score that applying students would need to score above to be admitted. For student selection, the ideal cut score should best differentiate between students who will obtain high and low grades.

For example, Figure 3 shows a proposed cut score and its ability to differentiate between high and low GPA students. These results showed that implementing cut scores with TalentLens' assessments would increase the university's ability to admit students who would obtain higher grades at school.

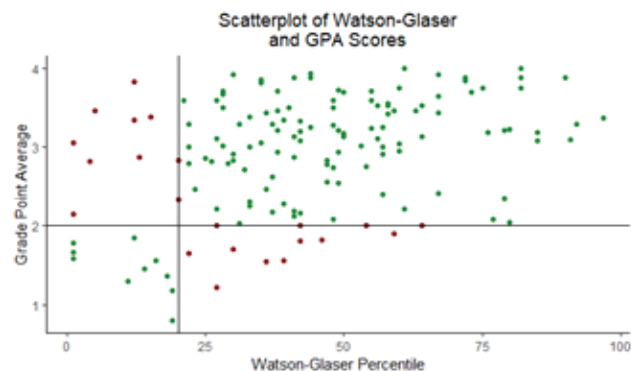


Figure 3. Scatterplot of students' W-G III and GPA scores. Points are colored based on a proposed 20th percentile cut score on the W-G III and success criteria of GPA > 2.0. Green points denote correct placement (a student with a W-G III above 20th percentile and GPA > 2.0 or a student with W-G III below 20th percentile and GPA < 2.0) and red points denote incorrect placement.

Summary

Overall, the ability of the W-G III and Core Abilities Assessment to predict student GPA is consistent with academic literature studying the effect of cognitive ability and student grades.^{2,3} Thus, the W-G III and Core Abilities Assessment are strong options for educators interested in using assessments for selecting students.