

Questions of transition between secondary and tertiary psychology programs

BERNADETTE HOOD, CYNTHIA FAN & GERARD A. KENNEDY

Psychology has become a popular senior school elective subject in Victoria. In 1997, 26 percent of all Victorian Certificate of Education (VCE) students elected to study psychology in their final year of secondary school (Board of Studies, 1997).

First-year tertiary psychology programs have traditionally assumed that students have had no knowledge of the discipline, and course curricula reflect the introductory nature of the program, with a focus on core concepts of psychological theory and practice. The development of secondary psychology programs has, however, resulted in first-year tertiary programs now comprising an amalgam of 'new' and 'continuing' psychology students. Figures obtained from two Victorian universities – La Trobe and Victoria University of Technology (VUT) – show that approximately 50 percent of students entering first-year psychology courses in 1997 had completed VCE psychology, and the current secondary trend predicts that this percentage will continue to increase over the next few years. Continuing students report that the introductory tertiary program is closely aligned with the secondary curriculum and their claims of 'having done it all before' are partially supported by the comparisons of secondary and tertiary curricula which identify considerable overlap across core topics in psychological theory, such as perception, learning, memory processes, social psychology and principles of psychobiology. The challenge for tertiary psychology educators is therefore to adapt to this new amalgam of first-year tertiary students.

One potential solution to the emerging difficulties of the heterogeneity of first-year psychology students is to adopt the model of other specialist discipline areas and set secondary psychology as a prerequisite for entry to university psychology courses. One implication of this solution would be that the introductory course curriculum would assume that students come to tertiary psychology programs with a specified knowledge base in the discipline.

The extent to which secondary specialist courses provide appropriate preparation for tertiary programs remains inconclusive, however. Several studies have examined the generic relationship between secondary and tertiary academic performance. Everett & Robbins (1991) report their evaluation of the predictive ability of secondary performance scores (tertiary entrance scores, TES, and the general Australian Scholastic Aptitude Test, ASAT) across nine tertiary discipline areas. The study, which comprised a sample of 1695

students, identified clear predictive powers for the TES across all identified courses with comparatively more powerful predictive relationships for science than humanities-based disciplines. Schofield (1989) reported similar findings in a study of 585 entrants to Melbourne University. Both internal school performance assessments and external examination results provided useful indicators of tertiary performance in commerce and science areas. The predictive power for humanities-based subjects, while less conclusive, remained statistically significant. Schofield (1989) cautions however that the validity of predictive evaluations may incorporate a socioeconomic bias with tertiary entrance scores generally underestimating tertiary performance for disadvantaged students.

In addition to these generic findings several studies have evaluated the transition of students between specific secondary and tertiary courses. Secondary mathematics and physics performance have been linked to success in tertiary physics courses (Bailey, Logan & Sleet, 1985; Bailey, Emeleus & Logan, 1988; Rowell, Dawson & Pollard, 1993). Preclinical medical school achievement has been shown to be predicted by both secondary school science and English subject performance (Lipton, Huxham & Hamilton, 1987) and secondary performance in accounting and mathematics are effective predictors for introductory accounting courses (Auyeung & Sands, 1993).

As psychology is a relatively new discipline in Australian secondary schools there has been limited evaluation of transitional issues, though a pilot study by Fan & Hood (1995) concluded that no significant difference existed in semester one tertiary grades between new and continuing students in a first-year psychology program. Fan & Hood (1995) also demonstrated that, for students who had completed secondary psychology, the aggregate secondary performance scores provided a better predictor of subsequent tertiary performance than secondary psychology grades.

The present study aims to extend this pilot work by Fan & Hood (1995). Using a larger and more diverse student data set this study aims to evaluate the following research questions:

- For students completing VCE psychology is there a significant relationship between secondary and tertiary psychology performance?
- Are there significant differences in the performance of new and continuing students in introductory psychology programs?
- Do student ability levels impact on the potential transfer of skills between secondary and tertiary psychology programs?
- Do student ability levels impact on the comparative performance of new and continuing students in introductory psychology programs?

METHOD

Academic records of 681 students were incorporated in this analysis. The students were first-year psychology students from Victoria University, of which 227 had completed first-year psychology in 1993, 225 in 1994, and 175 in 1995. A group of 54 first-year psychology students from the 1995 La Trobe University cohort were also included in the data. As entry to the La Trobe University psychology program requires a higher secondary school aggregate than that required for Victoria University the inclusion of the La

Trobe data allowed for a more diverse range of student abilities. A total of 137 students (60 in 1993, 35 in 1994, and 42 in 1995) from Victoria University and 20 students from La Trobe University had completed VCE psychology.

RESULTS

Summary data

Table 1 provides summary data for the variables of VCE psychology, VCE aggregate scores and semester one tertiary psychology performance.

Table 1. Mean (standard deviation) performance scores of students across both universities

VICTORIA UNIVERSITY							
Score	Year	New			Continuing		
VCE psychology	1993	N/A			27.4	(4.4)	(n=60)
	1994	N/A			29.5	(4.9)	(n=35)
	1995	N/A			31.4	(4.7)	(n=9) ^a
					32.5	(4.7)	(n=33) ^b
VCE aggregate	1993	107.2	(8.6)	(n=67)	109.7	(11.1)	(n=60)
	1994	107.8	(10.2)	(n=19)	113.2	(13.4)	(n=35)
	1995	117.0	(26.3)	(n= 8) ^a	109.2	(30.2)	(n=9) ^a
		54.1	(13.2)	(n=14) ^b	48.9	(11.1)	(n=33) ^b
Semester 1 tertiary psychology	1993	58.0	(11.0)	(n=167)	59.9	(8.3)	(n=60)
	1994	58.6	(9.6)	(n=190)	60.3	(8.9)	(n=35)
	1995	56.5	(18.9)	(n=130)	57.5	(17.9)	(n=42)

LA TROBE UNIVERSITY						
Score	Year	New			Continuing	
VCE psychology	1993	N/A			41.6 (3.2) (n=19) ^b	
	1994					
	1995					
VCE aggregate	1993	152.5 (.7) (n=2) ^a 86.5 (5.4) (n=23) ^b			151 (n=1) ^a 84.6 (4.6) (n=19) ^b	
	1994					
	1995					
Semester 1 tertiary psychology	1993	53 (6.8) n=37			59.8 (5.6) n=20	
	1994					
	1995					

Note: The scoring protocol for VCE changed from 1993 to 1994 – scores superscripted 'a' represent students completing VCE in or before 1993 and scores superscripted 'b' represent students completing VCE in 1994.

As the system for reporting VCE scores changed across the course of this study, all VCE aggregate scores and VCE psychology scores were standardised separately within the two reporting systems, i.e. students taking VCE on or before 1993 and those taking VCE in 1994. Similarly, as comparative analyses of academic data both within and between universities is confounded by differences in reporting criteria and assessment strategies, all analyses of academic data reported in this paper will utilise standardised Z scores ($M = 0$, $SD = 1$).

Research Question 1: Is there a significant relationship between secondary and tertiary psychology results?

For students who had completed secondary psychology a correlational analysis was conducted to assess potential relationships between secondary and tertiary psychology performance scores. No significant correlation exists between programs ($r = .14$, $df = 155$, $p > .05$).

Research Question 2: Is there a significant difference in the performance of new and continuing students in introductory psychology programs?

To examine whether a significant difference exists in semester one tertiary performance between new and continuing students, an independent groups t-test was performed. Standardised data across both years and universities were combined to provide overall mean tertiary performance scores for both new and continuing students. The results show no significant difference between new ($M = -0.0168$, $SD = 1.029$, $n = 524$) and continuing ($M = 0.0560$, $SD = 0.887$, $n = 157$) students ($t = -0.80$, $df = 679$, $p > 0.05$).

As one potential explanation of the lack of effect between new and continuing students may be differences in ability levels between these student groups, a second comparative analysis of tertiary performance between new and continuing students was undertaken using an ANCOVA analysis, with student status (new versus continuing) as the independent variable and mean tertiary psychology performance as the dependent variable. Ability levels as defined by the VCE aggregate score were entered as the covariate. Students were excluded from the analysis if VCE aggregate scores were not available, leaving a subject pool of 290 cases. The results indicated that the effect of the covariate was significant, $F(1, 287) = 7.25$, $p < .01$. There was also a significant main effect for student status, $F(1, 287) = 5.50$, $p < .05$, with continuing students ($M = 0.056$, $n = 157$) scoring significantly higher on semester one tertiary grades than new students ($M = -0.17$, $n = 133$).

Since the effect of ability was significant in influencing tertiary psychology performance, a further analysis was undertaken on the relationship between secondary and tertiary psychology performance (see research question 1) to examine the potential impact of ability on this relationship.

Research Question 3: Do student ability levels, as measured by the VCE aggregate, influence the relationship between secondary and tertiary psychology performance?

The student data set was subdivided into two student groups on the basis of the VCE aggregate score. A low academic group was defined by students whose aggregate fell below the median aggregate and a high academic group defined by students above the median aggregate. Within the two ability groups the relationship between VCE aggregate

gate, VCE psychology and tertiary psychology was then determined using Pearson correlations. All figures represent Z score transformations.

- (i) *Low academic ability:* Correlational analyses were undertaken within this subgroup of students to identify potential relationships between the variables of VCE aggregate score, VCE psychology score and tertiary psychology score. For students below the median VCE aggregate score, there was no significant correlation between VCE aggregate and VCE psychology ($r = .06$, $df = 75$, $p > .05$). However a significant positive relationship existed between VCE psychology and tertiary psychology performance ($r = .24$, $df = 75$, $p < .05$).
- (ii) *High academic ability:* Correlational analyses were again performed to identify relationships between variables. For students above the median VCE aggregate score, a significant relationship existed between VCE aggregate and VCE psychology scores ($r = .30$, $df = 78$, $p = .007$). Tertiary psychology performance was not, however, significantly correlated with secondary psychology performance ($r = .18$, $df = 78$, $p > .05$).

Research Question 4: Within the subgroups of low and high academic ability are there significant differences in the performance of new and continuing students in first semester tertiary psychology?

As for research question 3 above, students were allocated to low or high academic groups on the basis of their VCE aggregate.

- (i) *Low academic ability:* Within this subgroup there were 77 continuing and 71 new students. Continuing students had a higher mean semester one performance score ($M = .0170$, $SD = .817$) than new students ($M = -.3553$, $SD = .801$). T-test analyses indicated that these differences were significant; $t(146) = -2.80$, $p = .006$.
- (ii) *High academic ability:* This subgroup comprised 80 continuing and 62 new students. No significant difference in semester one tertiary performance was found between continuing ($M = .0936$, $SD = .954$) and new students ($M = .0430$, $SD = .831$); $t(140) = -.33$, $p > .05$.

DISCUSSION

The current study identifies several significant findings. Preliminary analysis of the transition of students between secondary and tertiary psychology courses demonstrates no relationship between academic performance in the two programs, nor does the completion of secondary psychology appear to provide an advantage for students in the first semester of a tertiary psychology program. These findings are consistent with both the pilot work by Fan & Hood (1995) and the body of American research in the area (e.g. Federici & Schuerger, 1976; Hedges & Thomas, 1980; Carstens & Beck, 1986; Griggs & Jackson, 1988) which concludes that "taking high school psychology does not profit a student in his performance in an introductory college-level course" (Federici & Schuerger, 1976, p.173).

The current study explored these transitional issues further by evaluating the extent to which the transfer of skills between programs may be moderated by student ability levels. When student ability levels, as defined by the VCE aggregate, were controlled for, continu-

ing students performed significantly better than new students in the tertiary course. Further analyses of the relationship between ability levels and the articulation between secondary and tertiary programs identified, however, a more complex pattern of transition. For high-ability students the completion of secondary psychology remains unrelated to tertiary psychology performance and appears to provide no advantage over academically matched new students in tertiary psychology. Tertiary psychology performance in this high ability category is, however, correlated with the students' VCE aggregate grade. For low-ability students a weak though significant positive correlation exists between secondary and tertiary psychology performance. In addition, continuing students in this low-ability category perform significantly better than new students in the tertiary psychology course. Completion of VCE psychology therefore appears to be related to, and provide an advantage for, tertiary psychology performance only for less academically able students.

Hedges & Thomas (1980) report on a similar pattern of knowledge transfer between secondary and tertiary psychology courses to that identified in the current study. Whilst no overall differences in performance between new and continuing students was found, when students were divided into high, medium and low-achievement groups only the low-achievement continuing group demonstrated an advantage over academically matched new students. The level of advantage was significant with 52 percent of low-ability students with no secondary psychology failing midterm in comparison to only 8 percent of the low-ability continuing students. This finding of secondary advantage remained consistent, though less significant, for final course grades in the introductory psychology program (Hedges & Thomas, 1980). Hedges & Thomas (1980) explain these findings by suggesting that academically more able new students compensate better for the lack of secondary grounding and that the failure of more able continuing students to demonstrate an academic advantage over matched new students may reflect either a ceiling effect within the tertiary grading system or decreased effort by these continuing students within the tertiary course.

Bailey, Emeleus & Logan (1989) report on a similar interactive effect between overall academic ability and secondary course experience on performance in tertiary physics. Students with no secondary grounding in physics and low overall academic ability had less than a 13 percent pass rate in stage 1 of tertiary physics. As the overall secondary aggregate increased, completion of secondary physics became a less critical factor in tertiary physics performance.

The interaction between student ability levels and the transfer of skills and/or knowledge between secondary and tertiary psychology programs is difficult to explain. Whilst students of low academic ability appear to gain some advantage from the specialist secondary psychology course the performance of more able students is associated with their overall ability level rather than their previous exposure to the discipline area.

There has been substantial research into transitional issues for students moving from secondary to tertiary learning environments (Clanchy, 1981; Hunter, 1989; Martin, Ramsden & Bowden, 1989; Matthews, 1991; Findlay, 1994; McKenzie, 1994; White et al., 1995). One constant theme of this research is that students identify changes in the learn-

ing *process* at university more difficult than issues of curriculum *content*. For example McKenzie (1994), in attempting to redress a 40 percent attrition rate for first-year computing students, consulted with secondary teaching staff to assess the difficulties associated with curriculum transitions. The secondary teachers reported that student transitional difficulties were not primarily related to content difficulties but rather to process issues in learning, specifically the limited availability of tertiary teaching staff for guidance and feedback and more generally the increased expectations of autonomy for tertiary students. Success in introductory tertiary psychology requires the student to develop a discipline-specific knowledge base whilst managing the more complex task of acculturating to a the tertiary process of learning. Perhaps the academically more competent student is able to adapt more readily to the *process* change and this is the central factor in success for semester one in the introductory tertiary program. Completion of secondary psychology for the less able student may provide some *content* base, allowing the student more space to manage the critical process issues. This explanation remains at the moment only speculative, and needs to be evaluated by future research.

SUMMARY

In conclusion the present study suggests that only students with low VCE aggregate scores show a significant positive relationship between secondary school psychology and tertiary psychology performance scores. This can be interpreted to support the contention that, for students performing at a lower level, studying VCE psychology provides a useful orientation to subsequent studies in psychology at the university level. For more able students tertiary psychology performance is related to overall ability as measured by the VCE aggregate rather than secondary psychology performance. The successful transition between secondary and tertiary education in psychology appears therefore to be primarily determined by generic aspects of student ability, with discipline-based knowledge being of secondary importance. However, for students entering university with below-median academic ability, the secondary psychology course may well provide a buffer towards facilitating successful transition.

Dr Bernadette Hood, Cynthia Fan and Gerard A. Kennedy are associated with Victoria University of Technology, Victoria.

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