

Running Head: THE ECONOMIC VALUE OF PSYCHOLOGY

The economic value of psychology in Australia: 2001

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Abstract

The purpose of this paper was to update the Guldberg & Sivaciyan (1995) estimates of the value of psychology based on 1991 figures. In addition, this paper expands the scope of their work by including comparisons of other related professional groups (those with tertiary training in psychiatry, mental health nursing, social work, counselling, occupational therapy, and human resources). Economic modelling indicated that psychology contributes \$8.6 billion to the National economy – some 500% more than in 1991, and more than all other related professional groups combined. However, psychology incomes in most sectors have marginally decreased in real terms, and still lag 9.2% behind related professionals. The number of individuals trained in psychology has also risen dramatically to at least 37,978. Many of these individuals (17,364) have only a bachelor degree, and experience a higher rate of unemployment than both their higher qualified peers in psychology, and the national average for individuals with the same level of qualification. The ongoing lack of Federal funding for professional higher degrees, and the training guidelines of the Australian Psychological Society are likely to lead to rises in the cost of postgraduate education in the coming years. There is nonetheless a substantial economic advantage to students undertaking professional higher degrees in psychology. The implications for the profession of psychology are discussed.

The economic value of psychology in Australia: 2001

In 1995, Hans Guldberg and Seven Sivaciyan were the first to systematically estimate the economic value of psychology in Australia, thanks to a commission from the Australian Psychological Society (APS). Their figures were current as at the 1991 Census and the corresponding National Account figures. Estimates such as these have been valuable to the profession, and have been quoted by the APS in a number of submissions to Government over the past half-decade (e.g. their submission to the Review of Higher Education Financing and Policy). However, estimates lose their currency if they are not updated. The purpose of this paper is to update the Guldberg & Sivaciyan (1995) estimates of the value of psychology in 1991, to estimates based on the 2001 Census and the corresponding National Account figures (Australian Bureau of Statistics 2002, 2003). In addition, this paper will expand the scope of Guldberg & Sivaciyan's (1995) work by including comparisons of other related professional groups (those with tertiary qualifications in psychiatry, mental health nursing, social work, counselling, occupational therapy, and human resources).

The Economic Value of Psychology

While defensible estimates of the economic value of psychology are possible, they can never capture the social value. How do you put a figure on a life saved, on giving a scared child new hope, or on taming fear? How do you put a current value on an effect that can last and even amplify over a lifetime? Estimates of the economic value of psychology are therefore always incalculably smaller than the true value, and thus represent an unavoidable underestimation. These estimates are nonetheless better than no

estimates at all, when it comes to communicating to policy makers and funding bodies the value of the profession.

Guldberg and Sivaciyani (1995) defined the direct economic value of psychology in terms of its contribution to Gross Domestic Product (GDP). GDP is a national accounting measure of production occurring in the whole economy. Everyone that works for an income contributes to it, and collective productivity is always worth more than we are collectively paid, because we utilise other non-human resources to increase our productivity. Australia (as do other OECD member countries) uses GDP as their primary estimate of the economic value of industry. Guldberg and Sivaciyani (1995) noted that while a professional groups are not an industry, the same principle of estimating productivity could apply to groups of professionals if one could logically attribute a portion of productivity to the professionals within that industry. I should highlight at this stage the use of the terms *profession* and *professionals*. For the purposes of this discussion, the former refers to the group to which one identifies, and is qualified. The latter refers to any individual who works for a living, and who holds some level of related tertiary qualification. By these definitions, a profession is a recognised subset of professionals. Unfortunately, there is no direct way to make this distinction from the National Accounts figures regularly provided by the Australian Bureau of Statistics (ABS). The economic modelling presented below therefore refers to the collective economic contribution of *professional groups*. The micro-economic implications of these estimates can, and will later be applied to the *profession* of psychology.

Guldberg and Sivaciyani (1995) developed a method of estimating the contribution of psychology graduates to GDP (GDP_{Ψ}) by utilising information contained in the Nation

Census of 1991. They first determined the number of people with psychology qualifications (bachelor degree or higher) working in each industry, and then determined their total income ($\Psi Payroll_{ind}$). Guldberg & Sivaciyan (1995) then determined the total payroll for each industry (everyone including those with psychology qualifications - $TotalPayroll_{ind}$). Finally they turned to corresponding (1991) National Account figures in order to determine the ratio of GDP (GDP_{ind}) to payroll for each industry. Assuming that those with psychology qualification contribute at least as much to productivity as other workers (i.e. the same ratio applied at least on a gross level), they could estimate the contribution of those with psychology qualification to GDP for each industry from their income (Equation 1).

$$GDP_{\Psi} = \sum \left(\left(\frac{GDP_{ind}}{TotalPayroll_{ind}} \right) \times \Psi Payroll_{ind} \right) \quad (1)$$

This methodology implies a number of things. Firstly, the total of what psychology graduates are paid is a key feature of the calculation on the basis that their income flows back into the economy as spending and investment. This is not to say that the professional group is paid what they are worth, merely that in a capitalist economy we are manifestly willing to work (supply) for what the country is currently prepared to pay (demand). Secondly, this figure includes everyone with an undergraduate degree or higher in psychology, whether or not they are registered as a psychologist, and whether or not they earn an income. This is so for the simple reason that most everyone with qualifications uses their training (by virtue of their choice to undertake it) in their work – not just registered psychologists. Likewise, the fact that many individuals with

psychology qualifications work casually, part-time, voluntarily, or not at all, is also a fair reflection of the range of professional outcomes (and hence the direct economic value). Finally, the degree to which workers contribute to GDP varies with the nature of the industry. Some industries are more reliant on capital plant and equipment than on staff (e.g. mining); hence the ratio of GDP to payroll is much higher than in an industry like education. Nonetheless, the logic of this method still holds because the miner using a multi-million dollar piece of equipment is potentially more productive than a hundred miners with picks and shovels. Psychology may not have the same degree of productivity amplifying technology, but GDP still has a meaningful (albeit varying) relationship with payroll.

Guldberg and Sivaciyan (1995) also spoke of what they termed *social value*, which is the economic value of preventing illness, treating illness more cost-effectively, and optimising human performance. Ideally the economic and social value should be one and the same, but the lack of methods to reliably estimate the social benefits of psychology means the direct economic value probably lags behind the social value.

While some methods for estimating the value of prevention (Kenkel, 2000), cost-effective treatment (Kaplan & Groessl, 2002; Garber, 2000; Miller & Magruder, 1999; Yates, 1998), and optimising human performance (Cascio, 2000; Fitz-enz, 2000) are emerging, their underutilisation in the scientific literature currently prevents a gross National costing based on actual social value. There are however some encouraging preliminary studies in relation to the cost effectiveness of psychotherapy for a whole range of disorders (Miller & Magruder, 1999), and the cost-effective role psychologists can play in the wider health care setting (Groth-Marnat & Edkins, 1996).

Nevertheless, Guldberg and Sivaciyan (1995) attempted to estimate the gap between direct economic value and social value by examining the difference in the average income for those qualified in psychology, compared to those qualified in other disciplines, and then add this percentage on to the direct economic value of psychology. Strictly speaking, this method will invariably underestimate the true social value because it does not directly value current direct or interaction effects, or long-term effects for individuals, families, organisations, or communities. This method can however identify an unjustifiable market anomaly in the way the economy values one professional group compared to others. Correcting any gap in income would therefore close any gap in relative economic value, but not necessarily close the gap between direct economic value and the social value of psychology, because the adjustment could be in either direction. In other words, the value of psychology as a profession could just as easily be reduced if their salaries were above the average professional salary. For this reason, Guldberg and Sivaciyan's (1995) method for estimating social value was not used here, nor is any alternative yet available.

Guldberg and Sivaciyan's (1995) figures of the economic value of psychology have been adjusted for inflation (1991 to 2001) and corrected for a few minor computational errors in order to be directly compared to 2001 figures presented in Table 1 (2001 National Accounts and Census figures were obtained from the ABS). Care should be taken in interpreting these figures in subsequent years given they are likely to grow with inflation. These figures do nevertheless indicate about a 500% real growth (i.e. growth above inflation) in the contribution of psychology to National productivity. While this figure may seem inexplicably high, one needs to understand that psychology started

from a relatively low base in 1991. Psychology has also benefited from the combined effects of a strong growth in GDP over the decade (ABS, 2002), a marked increase in the number of individuals trained in psychology (Table 6), and a dramatically higher growth rate for psychology jobs compared to virtually every other occupational group which has increased the proportion of *psychology trained individuals* as a function of the total workforce (ABS, 2001).

Table 2 illustrates the relative economic contribution of related professionals to GDP. While it is clear that those with tertiary psychology qualifications contribute more to the National economy than all related professional groups combined, this finding should be understood in relation to how the *professional* groups were defined for the purposes of this study. As has already been discussed earlier, individuals were associated with a professional group based on their chosen study major. While some migration between professional groups is possible (e.g. someone who studies psychology may work in human resources), the migration was assumed to be bidirectional and proportional. If this is the case, then the gross National figures presented here would be relatively undistorted. Yet given that testing these assumptions is not possible with the data provided by the Census, more research is warranted. Further, these findings compare professions which have quite different levels of accepted qualification (e.g. counsellors vs. psychiatrists), and professions which accommodate different levels of accepted qualification (e.g. psychologists and human resource professionals). In this regard too, more research is required to directly compare the income of those accredited in a given profession, rather than the indirect estimates based on all individuals with related qualifications presented here.

Individual Income

Table 3 shows the increase/decrease in average annual earning from 1991 to 2001. Because the ABS gathers information about income groups rather than exact income, these figures are not statistical means, but the weighted average (weighted by the number of individuals in each income group) of income group medians. For this reason the weighted means were not calculated for cells with less than 30 individuals because the weighted mean may not reflect the true mean for so few individuals.

The figures in Table 3 point to a real decrease in annual income in most sectors. While it is impossible from these figures to determine the cause of the decline, it may be the combined effect of industry deregulation, industrial reforms, and increases in permanent part-time and casual employment. Specifically, a decline in the average income in the Manufacture, Utilities and Banking sectors probably does point to a dramatic proportional increase in the number of part-time and casual staff with psychology qualifications. This reduction in real terms was also reflected for those with Masters and Doctoral qualifications in the Property & Business Services, and Arts & Entertainment industries. There was also a decline in average real income for those with either Bachelor or Honours qualification (the former being quite dramatic). Further research into the causes of these declines is needed. It is also evident that there is a clear progression in average annual income positively associated with the level of qualification.

Implications for postgraduate students

Now that the difference between the average incomes for those with Honours (or equivalent), Masters, and Doctorate is evident, one can estimate the average gross economic benefit (*net present value*) of undertaking postgraduate studies by multiplying the difference in income by the number of years until retirement. In fairness, this figure should be tempered by the costs the student faces in the form of lost income while studying and direct Program fees. In order to produce the figures displayed in Table 4 I have assumed that the student will study full-time (2 years for Masters and 3 years for Doctorate) and forgo what their lower degree average income would have been for that time (\$42,509). I have also assumed that the cost of the degree is the average of the fees available on the websites of Australian universities in 2003 (it is also worth highlighting that Masters Courses ranged from Government [HECS] subsidised to \$37,820, Professional Doctorates ranged from \$18,000 to \$44,000). The net economic benefit is therefore the gross economic benefit which varies depending on the number of years to retirement, minus the loss in income, minus the cost of the degree (in this example \$19,349 for Masters, and \$28,455 for Doctorate).

A summary of these example calculations is presented in Table 4. The results indicate that postgraduate qualifications are, on average, of considerable economic benefit to those who on completion of their higher degree, and have 20 or more years till retirement. These figures also indicate that a Professional Doctorate is, on average, substantially more valuable than a Masters qualification. While the average difference in income for various levels of qualification is real, this should not be interpreted to mean that a postgraduate qualification automatically leads to a higher income, merely those

more highly qualified individuals tend to do better on average. It is also likely that these figures are underestimations given that the only other alternative to gaining professional registration is a supervised practice program. While State and Territory requirements vary, this non-degree alternative is not without cost if private colleges and supervisors charge a fee for their services.

These estimates clearly indicate that there is room for postgraduate program fees to rise substantially without compromising the favourable cost-benefit surplus for most students. In fact preliminary modelling indicates this may need to occur rapidly over the coming years. Postgraduate programs that are not largely or wholly research degrees, do not attract any Australian government funding, and the failure of these programs to break-even and yet continue to employ staff, could amount to misappropriation of public funds in the eyes of the Australian Auditor General. In order for postgraduate programs to meet APS (2000) Accreditation Guideline they need to maintain a full-time equivalent (FTE) student to full-time equivalent staff ratio of 6 to 1 or better (Section 3.3.8). These guidelines also stipulate that 3 full-time staff members need to be largely associated with the program (Section 2.4.9). For the sake of this example I have interpreted this to be equivalent to 2 FTE staff members for each postgraduate program. This would mean the minimum program would consist of 2 FTE staff, and no more than 12 FTE students (an annual FTE intake of 6 students per year for a Masters program).

Assuming that staff cover all teaching and supervision without the need for other casual staff, and that the average FTE staff member cost \$63,012 (the 2001 average for PhD qualified in Education) plus 17% on costs per annum. Further, that any other sundry expenses of the program are covered by any sundry revenue (e.g. Clinic fees), and

facilities are provided free by the university, then a Masters program could not break even charging \$20,000 (around the 2003 average) per student per program even with an intake of 50 students per year. More realistically, in order to cover just university staff costs a Masters program with a minimum intake of 6 FTE students per year would need to charge around \$25,000 per student per program (in 2001 dollars). Even with a larger number of students, a larger Masters program could not generate a revenue-to-cost surplus given the APS guidelines to maintain a minimum student/staff ratio. If the program could not contain its costs as has been assumed here, or wanted to achieve a surplus, then even higher fees in the order of \$30,000 per student per program (again, in 2001 dollars), will need to be charged. Program fees would need to be half as much again for a Professional Doctorate program.

Perhaps more than any other estimates presented in this paper, the cost of postgraduate training is the least definitive. The issue of compliance with APS guidelines, and cost containment is complicated when one considers that guidelines and their interpretation are under regular revision, anecdotal evidence from a former Head of Department (G. Fogarty, personal communication, May 7, 2004) suggests that staff costs can easily be twice the estimates presented here, and the definition of direct and indirect costs is not at all clear. While further research is warranted, what is clear is that there is strong upward pressure of postgraduate course fees.

Implications for professional income

Table 5 also reflects the relatively low annual incomes noted earlier for the Manufacturing, Utilities, and Banking sectors. These poor professional incomes are

evident for all the professional groups related to psychology. It is also evident that those with tertiary qualifications in psychology are paid less on average than related professional groups. In fact, those with psychology qualifications would need to be paid 9.2% more just to receive the average annual income (\$45,778). One can interpret this to be a fair standard professional income for professional groups related to psychology. What this implies for psychologists in private practice is captured in Equation 2.

$$SSF = \left(\frac{SPI}{1 - OH\%} \right) \div WW \div SpW \quad (2)$$

The standard session fee (SSF) should be some rational function of the standard professional income (SPI), the percent of gross income needed to cover overheads (OH%), the number of working weeks in a year (WW), and the number of sessions per week (SpW). Estimates presented above suggest that the SPI for those with a Masters degree (the criteria for membership of the APS) should be \$53,771 (Table 3 average for Masters plus 9.2%). Research by Garton and Symons (2001) showed that only 8.9% of private practicing psychologists in Australia face overheads greater than 64% of gross income (OH%). This figure would therefore cover professional expenses for the majority of private practicing psychologists. Assuming a full-time professional takes 4 week holiday per year, and enjoys 10 public holidays, the WW would be 46. And finally it is assumed that if a psychologist works a 40 hour week that half that time will be devoted to administration, professional development, report writing, preparation. The balance of the working week (20 hours) constitutes the billable hours (i.e. the potential for 20 sessions per week: SpW).

$$\left(\frac{\$53,771}{1-64\%}\right) \div 46 \div 20 = \$162 \quad (3)$$

While this model could be refined to account for more empirically based estimates of SpW, it does suggest that SSF should have been \$162 in 2001 (Equation 3). While this figure should be indexed each year in order to keep pace with inflation, it is also possible to discount it without adversely affecting income if business expenses can be contained under 64% of gross income.

Professional Supply and Demand

While Table 6 shows the change in number of persons with qualifications in psychology, these figures are likely to be underestimations because anyone who has subsequently gained a higher qualification in another discipline would be lost given the Census only ascertained the highest level of qualification. The figures in Table 6 indicate that there were 37,978 individuals with a bachelor degree or higher in psychology. Of these only 13,943 had qualifications of Honours (or equivalent) or higher, and could therefore (at least historically) be registered as Psychologists. In fact, there were 18,761 either conditionally (provisionally) registered or fully registered as Psychologists in Australia in 2001 (figures available via public registers). The discrepancy of 4,818 more on State and Territory registers than were apparently qualified to be registered may give some indication of the magnitude of the underestimation. This reasoning appears to be supported by a study by de Looper (1994) on 576 graduates with a major in psychology found that 35.4% went on to gain higher qualifications in another discipline. If de

Looper's (1994) estimate is correct then about 35.4% of those registered (6,641) would have a higher degree in a field other than psychology (e.g. Public Health or Business Administration). Thus, while it may be an underestimation, the best estimate of the growth in the number of those with psychology qualifications is 53.8% between 1991 and 2001. The membership of the APS grew by 106% (to 13,007) during the same decade (Crowe, 2001). Quite simply, Psychology in Australia has never before seen a period of such dramatic growth.

Table 7 also illustrates that there are more individuals with psychology qualifications in virtually every industry than all other related professional groups combined. The exceptions was in Community Care where those with qualifications in social work were dominant, and the Utilities and Mining industries where those with qualifications in human resources were dominant.

Table 8 illustrates two issues, the high numbers of individuals with qualifications in psychology at every level of degree relative to other related professional groups, and the marginal oversupply of those with only a bachelor qualification in psychology. At 4.5% the unemployment rate was above the National average for those with university qualifications at 3.4%.

In the first instance these data lend weight to Lancaster, Milgrom & Prior's (2001) argument that psychologists are underutilised both in relation to their relative level of qualification, and in relation to their particular skills given that Lancaster et al. (2001) noted that psychologists within the Victorian Public Health system spent 48% of their time in generic activities. It is important to be clear that the term *oversupply* is used in the economic sense to denote a greater availability of graduates than the economy has

absorbed. That is not the same thing as saying that these graduates have nothing to offer, or that they would not be productive if employed, or indeed that they will not one day be employed – merely that they were not then employed. Oversupply and ongoing governmental cost containment can place downward pressure on professional remuneration. Given psychology in the United States also faces a broadly similar situation one could argue for the need to curtail the training of psychologists (Robiner, 1991).

There are at least four possible responses to oversupply among undergraduates. Firstly, ignore it. The oversupply is only marginal and may only be temporary as capitalist markets usually move to close temporary anomalies. Secondly, undergraduate intake could be limited. While this may improve the average quality of students, it is likely to be unpopular with Psychology Departments struggling to maintain their income. Thirdly, mandate a higher level of professional training where the graduates are more employable (Helmes & Wilmoth, 2002). While there may be benefits to this, simply mandating more time in training does not ensure quality training and hence a better level of professional skills (Dyck & O'Donovan, 2003).

Finally, the profession could attempt to stimulate demand by demonstrating the relative cost-benefit of their work. In this pursuit, I too join growing calls for cost-benefit analysis to be a routine part of our intervention outcome research (Singh, Hawthorne & Vos, 2001; Knapp, 1999; Mason, Eccles, Freemantle & Drummond, 1999). Further, affecting demand has also got to address public perceptions, though this may be easier said than done. Janda, England, Lovejoy and Drury (1998) noted that ill-conceived campaigns designed to educate the public about psychologists can actually have a

negative impact on public perception. Janda et al. (1998) went on to argue that psychologists should emphasise the scientific nature of their profession and strive to differentiate psychology from other related professional groups, but this too is difficult if epistemological debate undermines a collective stance.

It is also important to recognise that while there may be a marginal oversupply of those with no more than a bachelor degree in psychology, this gross level of analysis does not take sufficient account of different supply and demand situations in each State and Territory, rural and metropolitan areas, the constantly expanding nature of the profession (VandenBos, DeLeon & Belar, 1991), or the different specialisations within the profession of psychology (Pion, 1991). The data available in the Census is less helpful in this regard because it is no more specific about each individual's qualifications than to denote them as "psychology" or "behavioural science". Nevertheless, a crude insight into differential demand can be gleaned from a comparing the ratio of registered psychologists to the total population in each State and Territory (as at the 2001 Census). The Australian Capital Territory is the best supplied (628 persons for every psychologist, p/ψ), followed by Victoria (805 p/ψ), New South Wales (959 p/ψ), and Western Australia (1,062 p/ψ). Queensland (1,281 p/ψ), the Northern Territory (1,359 p/ψ), Tasmania (1,698 p/ψ), and South Australia (1,766 p/ψ) had less psychologists per capita than the National average (1,195 p/ψ). Clearly, further research and debate is warranted.

Summary

The economic contribution of psychology has grown dramatically to \$8.6 billion along with the very strong domestic economy and unprecedented growth within the professional group between 1991 and 2001. Despite this, individual income for

psychology declined in real terms over this period, and still lags 9.2% behind related professional groups. There is nevertheless a clear economic advantage to most students undertaking a professional postgraduate degree, however the cost of these degrees are likely to rise substantially in the coming years.

APS recommended fees may be marginally low given the economic modelling presented here, but simple supply and demand issues may mean that many psychologists in private practice struggle to achieve a professionally comparable income.

Whilst psychology dominates related professional groups in terms of numbers in virtually every industry, the profession must consider how best to address a marginal oversupply of Bachelor trained graduates, and increase general demand for psychologists as a whole, if downward economic pressure on income is to be remedied.

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Table 1
Economic contribution of psychology to GDP (AUS\$ million)[§]*

Industry	1991		2001	% Change
	1991	adjusted [†]		
Education	253.99	318.88	540.15	69%
Health	148.61	186.58	994.19	433%
Community Care	118.88	149.26	471.38	216%
Property & Business Services	196.44	246.63	1,480.49	500%
Government Administration	96.85	121.60	780.98	542%
Manufacture	55.05	69.11	622.58	801%
Wholesale	43.94	55.17	388.10	603%
Banking & Finance	42.95	53.92	418.87	677%
Retail	39.86	50.05	593.46	1,086%
Arts & Entertainment	32.98	41.41	561.25	1,255%
Insurance	20.45	25.67	225.87	780%
Communications	19.42	24.38	366.68	1,404%
Transport & Storage	18.86	23.68	513.10	2,067%
Utilities	18.26	22.92	108.69	374%
Construction	10.64	13.36	214.95	1,509%
Mining	9.54	11.98	133.49	1,014%
Defence	7.36	9.24	46.17	400%
Primary Production	6.12	7.68	152.57	1,887%
Total Economic Value	1140.20	1,431.52	8,612.97	502%

Note. *GDP excludes property ownership. [†]Adjusted to 2001 equivalent value in order to account for inflation (as measured by the Consumer Price Index) between 1991 and 2001.

[§]For individuals with a bachelor degree or higher.

Table 2

Relative economic contribution of related professional groups to GDP (AUS\$ million)[†]*

Industry	Psy	Med	MHN	SW	C	HR	OT
Education	540.15	6.33	1.16	84.15	85.13	52.92	15.42
Health	994.19	260.11	120.51	525.27	81.10	47.91	446.12
Community Care	471.38	4.03	11.12	571.48	85.87	19.49	54.08
Property & Business Services	1,480.49	5.84	6.71	277.86	82.40	555.82	81.82
Government Administration	780.98	5.42	6.23	578.31	51.09	174.53	30.78
Manufacture	622.58	0.79	4.51	65.59	23.78	459.52	25.02
Wholesale	388.10	0.41	4.20	44.18	12.68	186.74	14.65
Banking & Finance	418.87	2.73	-	33.96	6.46	210.33	6.25
Retail	593.46	4.81	7.11	109.72	21.59	245.24	40.23
Arts & Entertainment	561.25	6.79	2.03	126.94	24.34	150.78	20.37
Insurance	225.87	-	1.08	27.44	11.40	115.78	57.55
Communications	366.68	-	2.42	18.85	13.67	173.24	-
Transport & Storage	513.10	4.43	4.43	108.03	23.11	272.09	12.10
Utilities	108.69	-	-	9.00	4.88	123.23	7.00
Construction	214.95	-	-	52.96	7.56	113.12	16.76
Mining	133.49	-	-	15.13	-	253.00	-
Defence	46.17	-	-	9.35	1.30	41.33	-
Primary Production	152.57	3.68	8.79	64.95	14.29	47.35	34.97
Total Economic Value	8,612.97	305.38	180.29	2,723.17	550.67	3,242.42	863.10

Note. Psy=Psychology, Med=Psychiatry, MHN=Mental Health Nursing, SW=Social Work, C=Counselling, HR=Human Resources, OT=Occupational Therapy. *GDP excludes property ownership. [†]2001 dollars, for individuals with a bachelor degree of higher.

Table 3
Average annual income (AUS\$)

Industry	Bachelor		Honours [†]		Masters & Doctorate		
	1991*	2001	1991*	2001	1991* M & D	2001 Masters	2001 Doctor
Education	39,492	37,428	41,860	45,201	56,074	50,889	63,012
Health	38,393	39,561	42,153	41,637	48,290	49,574	53,062
Community Care	37,060	34,156	40,356	38,424	47,440	43,652	45,852
Property & Business Services	46,877	43,992	49,658	46,066	64,006	55,759	58,098
Government Administration	43,639	46,394	46,481	47,973	53,680	56,119	61,405
Manufacture	45,413	14,856	-	15,663	58,015	19,076	28,170
Wholesale	46,592	-	-	-	60,508	-	-
Banking & Finance	44,785	-	54,310	29,456	64,686	21,043	39,849
Retail	25,784	-	36,664	57,237	47,291	55,887	64,987
Arts & Entertainment	26,359	29,469	-	33,565	46,230	40,126	41,582
Insurance	46,261	-	-	48,500	-	49,782	73,658
Communications	43,167	-	-	36,790	-	29,992	43,350
Transport & Storage	39,182	-	-	43,315	-	48,422	51,651
Utilities	46,469	-	-	25,740	-	29,247	33,965
Construction	34,641	-	-	24,987	-	28,504	30,658
Mining	58,952	-	-	42,125	-	44,366	52,336
Defence	42,583	-	-	49,512	-	53,279	59,953
Primary Production	17,848	-	-	46,405	-	53,130	63,797
Other or not stated	35,551	-	40,307	45,901	53,583	50,246	62,383
Overall Average	39,315	28,741	43,457	42,509	53,046	49,241	58,803

Note.*Adjusted to 2001 equivalent value in order to account for inflation (as measured by the Consumer Price Index) between 1991 and 2001. [†]Honours or equivalent fourth year of study.

Table 4
*The average net present economic benefit to students of
 postgraduate psychology qualifications**

Years till retirement [†]	Upgrading from Honours to Masters	Upgrading from Honours to Doctorate
5	-\$70,702	-\$74,512
10	-\$37,037	\$6,958
15	-\$3,372	\$88,428
20	\$30,293	\$169,898
25	\$63,958	\$251,368
30	\$97,623	\$332,838
35	\$131,288	\$414,308
40	\$164,953	\$495,778

Note. *2001 AU\$. Also note that these figures may be underestimations given no account was made for the cost of a supervised practice program as an alternative means to gaining registration. [†]At the completion of study.

Table 5
Average annual income relative to related professional groups (AUS\$)*

Industry	Psy	Med	MHN	SW	C	HR	OT
Education	45,919	69,426	-	39,403	49,160	46,927	32,566
Health	44,346	70,913	46,907	43,238	40,095	49,439	41,036
Community Care	36,973	-	43,349	38,592	33,622	43,328	37,631
Property & Business Services	46,346	-	32,228	39,652	42,839	53,162	42,291
Government Administration	48,677	-	44,917	48,254	48,316	52,212	43,416
Manufacture	44,451	-	-	31,515	38,262	57,179	41,207
Wholesale	44,262	-	-	36,110	-	53,421	-
Banking & Finance	48,417	-	-	40,501	-	53,590	-
Retail	26,451	-	-	26,433	26,511	42,144	37,350
Arts & Entertainment	30,724	-	-	30,379	32,137	42,504	29,332
Insurance	47,696	-	-	45,817	-	51,085	55,769
Communications	50,811	-	-	-	-	58,171	-
Transport & Storage	43,375	-	-	38,826	-	55,504	-
Utilities	52,611	-	-	-	-	57,333	-
Construction	37,556	-	-	40,154	-	47,852	-
Mining	58,504	-	-	-	-	65,168	-
Defence	51,129	-	-	52,438	-	62,864	-
Primary Production	28,909	-	-	27,836	-	41,578	27,368
Other or not stated	16,219	31,939	14,421	16,168	15,345	15,758	13,618
Overall Weighted Average [†]	41,920	67,938	44,069	40,228	40,316	49,631	36,344

Note. Psy=Psychology, Med=Psychiatry, MHN=Mental Health Nursing, SW=Social Work, C=Counselling, HR=Human Resources, OT=Occupational Therapy. *2001 dollars, for individuals with a bachelor degree or higher.

[†]Weighted to number in each sector.

Table 6
Number of persons with psychology qualifications

Industry	Bachelor		Honours*		Masters & Doctorate		
	1991	2001	1991	2001	1991 M & D	2001 Masters	2001 Doctor
Education	3,004	3,179	512	781	1,716	1,424	1,198
Health	1,754	3,182	271	1,091	1,222	2,667	486
Community Care	1,992	2,613	308	683	524	845	82
Property & Business Services	1,074	4,111	134	582	255	753	234
Government Administration	1,626	2,736	211	504	350	704	107
Manufacture	514	803	24	64	43	93	9
Wholesale	402	509	21	45	36	39	9
Banking & Finance	463	780	31	62	69	83	14
Retail	676	1,512	40	104	54	89	3
Arts & Entertainment	638	1,226	24	89	76	101	31
Insurance	229	423	7	45	29	37	9
Communications	157	340	23	20	14	31	4
Transport & Storage	226	524	18	41	25	57	3
Utilities	84	71	6	13	12	12	3
Construction	121	191	12	11	15	22	6
Mining	33	49	12	6	3	12	0
Defence	132	141	19	33	25	38	16
Primary Production	95	139	9	18	12	18	15
Other or not stated [†]	4,144	1,506	258	154	911	277	66
Overall Average	17,364	24,035	1,940	4,346	5,391	7,302	2,295

Note. *Honours or equivalent fourth year of study. [†]These figures include unemployed and those who did not say which industry they worked in.

Table 7

Available workforce: Number of persons with bachelor qualifications or higher

Industry	Psy	Med	MHN	SW	C	HR	OT
Education	6,582	51	21	1,195	969	631	265
Health	7,426	1,215	851	4,024	670	321	3,601
Community Care	4,223	28	85	4,905	846	149	476
Property & Business Services	5,680	22	37	1,246	342	1,859	344
Government Administration	4,051	26	35	3,026	267	844	179
Manufacture	969	3	6	144	43	556	42
Wholesale	602	3	9	84	16	240	29
Banking & Finance	939	6	0	91	15	426	12
Retail	1,708	12	19	316	62	443	82
Arts & Entertainment	1,447	12	8	331	60	281	55
Insurance	514	0	3	65	26	246	112
Communications	395	0	3	24	15	163	0
Transport & Storage	625	3	6	147	27	259	16
Utilities	99	0	0	10	3	103	6
Construction	230	0	0	53	15	95	18
Mining	67	0	0	9	0	114	0
Defence	228	0	0	45	6	166	0
Primary Production	190	6	12	84	15	41	46
Other or not stated*	2,003	24	29	720	197	444	909
Total	37,978	1,411	1,124	16,519	3,594	7,381	6,192

Note. Psy=Psychology, Med=Psychiatry, MHN=Mental Health Nursing, SW=Social Work, C=Counselling, HR=Human Resources, OT=Occupational Therapy. *These figures include unemployed and those who did not say which industry they worked in.

Table 8

Relative level of professional qualifications (unemployment rate %)

Qualification	Psy	Med	MHN	SW	C	HR	OT
Bachelor	24,035 (4.5%)*	0 (0.0%)	850 (1.5%)	14,606 (2.4%)	789 (6.3%)*	4,488 (4.4%)*	5,712 (19.2%)*
Honours [†]	4,346 (2.2%)	107 (0.0%)	250 (0.0%)	462 (2.6%)	1,778 (2.8%)	1,938 (3.5%)*	244 (21.7%)*
Masters	7,302 (2.2%)	156 (2.6%)	24 (0.0%)	1,334 (2.7%)	1,007 (2.0%)	936 (3.5%)*	236 (14.8%)*
Doctorate	2,295 (1.9%)	1,148 (0.5%)	0 (0.0%)	117 (0.0%)	20 (15.0%)*	19 (0.0%)	- -

Note. Psy=Psychology, Med=Psychiatry, MHN=Mental Health Nursing, SW=Social Work, C=Counselling, HR=Human Resources, OT=Occupational Therapy. *National average unemployment for those with a bachelor degree or higher in 2001 was 3.3%. [†]Honours or equivalent fourth year of study.