

Correlates of career advancement in Australian universities

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Abstract. Academics in Australian universities who were lecturers in 1978 and senior lecturers by 1988, or senior lecturers in 1978 and readers/associate professors by 1988, are compared with academics who had remained at the same level of appointment over this period. Career advancement was associated not only with demographic variables, but with work habits, and level of performance in research-related academic roles. These measures were themselves intercorrelated. The variables that most distinguished the academics in the sample who had been promoted from those who had not included rate of publication in refereed journals, level of citation, research grants applied for and obtained, and the number of PhD students under a person's supervision. Likelihood of promotion was correlated negatively with self-reported commitment to teaching. This demonstration that career advancement is associated primarily with an academic's record of achievement in research is consistent with claims in the literature about the incentive and reward system operating within Australian universities.

Staffing levels in universities in Australian, as well as in Europe and North America (see Kidd 1981), peaked in the mid-1970s after 20 years of unprecedented growth. Between 1956 and 1975 the number of universities in Australia increased from nine to 19, and there was almost fivefold growth in student enrolments and full-time academic posts. In contrast, enrolments rose by only 18% between 1975 and 1985, while the number of academic staff increased in total by merely 5% (Commonwealth Tertiary Education Commission 1986). The end to growth in the Australian university system adversely affected career prospects for academics who had been recruited in the 1970s and 1980s (see Over 1985). Although numbers at each of the four tenurable levels of appointment (lecturer, senior lecturer, reader/associate professor, professor) were not directly subject to quota, budgetary pressures prevented the distribution of academic staff in Australian universities becoming top-heavy. Professors constituted 8.8% of all academics at lecturer level or above in 1975 and 9.0% in 1985; the respective values for readers/associate professors were 9.4% and 13.0%.

Over and Lancaster (1984) documented the extent to which the opportunity for career advancement in Australian universities declined over time. In an analysis covering four disciplines, Over and Lancaster showed that 45% of academics appointed to a lectureship in 1975–1976 had reached the level of senior lecturer within seven years, in contrast to 76% of academics who took up a lectureship in 1962–1964. As further evidence that prospects for advancement declined over time, 53% of lecturers in Australian universities were at the top of their salary scale (which has seven incremental steps) in 1985 in contrast to 29% in 1970. The values for senior lecturers (for whom there is a salary scale with five incremental steps)

were 65% in 1985 compared with 39% in 1970. Career advancement through moving from one university to another became less likely than had been the case in the past. In the comparisons undertaken by Over and Lancaster (1984), 24% of academics beginning as lecturers in 1962–1964 and gaining a senior lectureship within seven years did so through appointment at another university rather than as a consequence of promotion within the one university. However, only 5% of the 1975–1976 cohort demonstrated such mobility.

Although in the 1980s some Australian universities limited the number of readers of associate professors within the university as a whole or within a single department, no university has yet imposed a quota on senior lectureships. However, as indicated by numbers at the highest point on the salary scale, advancement from a lectureship to a senior lectureship is now by no means automatic. Unless many new posts are created or turnover in positions through retirement increases markedly, the career asymptote for the majority of academics appointed in Australian universities over the last 15 years is likely to be the grade of senior lecturer. Further, most academics appointed in the 1970s or 1980s can expect to advance from lecturer to senior lecturer or from senior lecturer to reader/associate professor through promotion within the university where they currently work instead of by appointment elsewhere. It is of interest, therefore, to examine factors that govern promotion.

All Australian universities have formal procedures through which academics can apply for promotion from lecturer to senior lecturer or from senior lecturer to reader/associate professor (see Allen 1988). Applications are considered by a specifically constituted promotion or selection committee within the university. Although neither the criteria nor the weighting given to criteria are uniform across the Australian university system, all universities specify scholarship as indexed by research and publication as the primary criterion for promotion to reader or associate professor (Allen 1988). Contributions through teaching, administration, and service are more likely to be used as supplementary criteria if the promotion is to the position of associate professor rather than reader. A senior lectureship has traditionally been perceived as the career grade within the Australian university system, and hence a senior lectureship is the level to which an academic can in time expect to advance by demonstrating competence in roles such as teaching, administration, and service in addition to research. In a survey at the University of Queensland, Moses (1986) found that most academics perceived promotion to be dependent mainly on achievement in scholarship and research. Although the promotions process included assessment of teaching ability and respondents generally believed that teaching should rate as a highly important criterion, few of the academics in the sample considered that adequate weighting was at present given to teaching ability.

In analyses that bear on career advancement, Williams, Blackstone and Metcalf (1974) compared British academics at several levels of appointment on demographic and other measures. Whereas professors were more likely than non-professors to have completed undergraduate training at Oxford, Cambridge or London, obtained first class honours, completed a PhD degree, worked in more

than two universities, and published at least three books, senior lecturers differed from other non-professorial staff mainly on the basis of age and years of experience. These differences led Williams *et al.* (1974) to conclude that, "Professors appear to be appointed frequently on the basis of merit – at least in terms of the indicators studied, whereas senior lecturers are more randomly chosen, possibly on the basis of being in the right place at the right time" (p. 120).

The present study is concerned with characteristics distinguishing academics in Australian universities who experienced career advancement within a defined period of time from academics who remained at the same level of appointment over this same interval. The groups to be compared comprise academics who held a full-time appointment in an Australian university in 1978 and in 1988. One comparison is between lecturers in 1978 who had been promoted by 1988 and lecturers in 1978 who had not been promoted by 1988. The other comparison is between senior lecturers in 1978 who had been promoted by 1988 and senior lecturers in 1978 who had not been promoted by 1988. The aim is to establish measures distinguishing academics who had achieved promotion during the 10 year interval from academics who had not been promoted over this same period.

The question addressed in data analysis is how well a person's academic rank in 1988 is predicted not only by demographic variables (such as sex, age, discipline, academic qualifications) and level of performance in roles such as publication, teaching and postgraduate supervision, but by personality characteristics, work habits, and level of commitment to the work of an academic. Attention is given to personality characteristics following the demonstration by Rushton, Murray and Paunonen (1983) that personality traits such as being liberal, sociable, and extroverted are associated with effectiveness in teaching. In contrast, research productivity was predicted by measures of achievement motivation such as being ambitious, enduring and dominant. Helmreich *et al.* (1980) similarly found positive correlations between research output and personality traits such as mastery (a preference for difficult tasks) and competitiveness. In a review of the literature on factors associated with research output, Fox (1983) pointed to differences in work habits and practices (such as the amount of time committed to work, the manner in which time was allocated, and simultaneous investigation of several problems) that distinguished productive from non-productive scientists. It is to be expected that demographic variables, personality characteristics, work habits, and performance indicators would themselves be intercorrelated. Interrelationships between these measures are taken into consideration in the analyses later reported that contrast academics in Australian universities who gained promotion between 1978 and 1988 and academics who had not been promoted.

Method

The data were collected as part of a study comparing men and women with a full-time appointment at lecturer level or above in Arts and Science disciplines at three Australian universities (La Trobe, Melbourne, Monash) in 1988. Entries in the

Commonwealth Universities Yearbook as well as current university calendars and handbooks were used to match, where possible, each women holding such an appointment with a male colleague at the same academic rank in the same department at the same university. The potential sample as identified by these criteria included 202 women and 167 men in Arts disciplines, and 57 women and 52 men in Science disciplines. At least two attempts were made to contact each person between June and September 1988 by visits to their office at the university. In all, 323 academics (Arts: 131 women, 112 men; Science: 45 women, 35 men), including 20 (9 men, 11 women) who declined to participate in the survey, were contacted. Each person was told that the study was concerned with individual differences in academic work roles such as research, teaching, and administration, and that participation involved completing and returning a questionnaire. The sample was increased by using entries in the 1988 edition of the Commonwealth Universities Yearbook to identify women at lecturer level and above in Science disciplines in all Australian universities, and matching each case wherever possible with a man at the same academic rank in the same department. Questionnaires were sent separately to the man and the women within each matched pair. The overall response rate to the survey was 75%. The 308 completed questionnaires came from 87 Arts women, 82 Arts men, 69 Science women, and 71 Science men.

The questionnaire sought demographic information (such as age, sex, discipline, academic qualifications, marital status, number of children), the person's history of employment as an academic (including their current academic rank and their rank 10 years beforehand), their work commitment and habits (not only the number of hours per week they worked, but how they distributed their time during work as an academic), professional networking (such as extent of association with eminent researchers in Australia and overseas), personality characteristics of the type assessed by Rushton *et al.* (1983), and performance in academic roles such as research, publication, postgraduate supervision, undergraduate teaching, and administration.

Whereas some questions required the person to provide information directly (e.g., to give their current age), a number of questions (e.g., those identifying current level of appointment, level of appointment 10 years beforehand, whether the person had completed a PhD degree) were in multiple-choice format and required the respondent to choose from among nominated options. Personality was assessed through a person rating (on five-point scales covering the range from "highly inappropriate" to "highly appropriate") the extent to which adjectives denoting traits such as "aggressive" and "ambitious" described them in their work as an academic. On other ratings (e.g., commitment to research, commitment to teaching) the respondents rated themselves relative to other tenured academics in their own department or in their own discipline across the Australian universities. In order to maintain confidentiality, respondents were told not to identify themselves by name or university. On completion, the questionnaire was returned in a pre-addressed post-paid envelope.

Results

The 309 respondents to the survey included 165 who had not held an appointment as lecturer or senior lecturer in 1978. The further interest is in the 144 respondents who were at lecturer or senior lecturer level in 1978. The first comparison is between lecturers in 1978 who had been promoted by 1988 ($N = 65$) and the 26 respondents who were at the level of lecturer in 1988 as well as in 1978. The contrast in the second comparison is between senior lecturers in 1978 who had been promoted by 1988 ($N = 16$) and the 47 respondents who were at the level of senior lecturer in 1988 as well as in 1978. The focus in each analysis is on measures that differentiate the academics who gained promotion from the academics who had remained at the same level of appointment between 1978 and 1988.

Promotion from lecturer level

Sixty-five academics in the sample who were at lecturer level in 1978 had by 1988 advanced to the status of senior lecturer ($N = 56$) or reader/associate professor ($N = 9$). This group will be contrasted with the 26 academics who were lecturers in 1978 and remained lecturers in 1988. Although the objective in the commentary that follows is partly to describe the sample under consideration, the focus is on identifying the variables on which respondents who had achieved promotion from the level of lecturer during the 10-year period differed from those who had not been promoted. For variables where a categorical response (e.g., "yes" or "no") was required, the groups were compared through chi square tests. Mean responses or ratings were available on other measures.

Table 1 reports means and standard deviations for demographic, work habit, networking, personality and role performance variables on which the difference in effect size between the two groups (the d values reported in Table 1) was .40 or greater. Effect size (d) is the standardized mean difference (the difference in mean score between academics who were promoted and those who were not, divided by the average of the standard deviations for the two groups). The larger the d value, the greater the difference in mean scores between the two groups. A d value of zero indicates that on the variable in question the academics who had been promoted had the same mean score as the academics who had not been promoted, and for d values of .50 and 1.00 the average score of academics in one group is greater than the score obtained by 69% and 84%, respectively, of academics in the other group. Table 1 also reports t test values based on comparison of means for the academics who were promoted and those who were not. The difference in means between the two groups was not statistically significant in the case of a number of measures where the effect size was .40 or greater. To avoid overinterpretation of results, the focus in the commentary that follows is on measures where differences between the groups are statistically significant at $p < .01$.

As indicated by non-significant chi square levels, there were no differences between the academics who had been promoted and those who had not in terms of

Table 1. Mean scores on demographic, personality, work habits, role performance and other measures, together with effect-sizes (*d* values), for academics who were lecturers in 1978 and had been either not promoted or promoted by 1988

Lecturers in 1978 (Status by 1988)	Not promoted (N = 26)		Promoted (N = 65)		<i>t</i>	<i>d</i>
	M	SD	M	SD		
<i>Demographic variables</i>						
Age at completing PhD	34.2	5.2	31.5	6.8	2.06*	.45
Years as PhD candidate	4.9	2.0	4.2	1.3	1.65	.44
<i>Personality characteristics</i>						
Rigorous	3.5	0.9	3.9	0.7	2.03*	.52
Aggressive	2.0	0.9	2.5	1.2	2.16*	.44
Dominant	2.0	1.0	2.5	1.1	2.09*	.41
Ambitious	2.7	1.0	3.1	1.1	1.67	.40
<i>Affiliations</i>						
Leading researchers as friends	2.1	0.8	3.2	1.0	5.50**	1.22
Network within Australia	2.1	0.9	3.0	1.1	4.07**	.90
International conferences	0.7	1.0	2.0	2.1	3.99**	.88
<i>Work habits</i>						
Commitment to research	2.9	0.9	3.7	0.8	3.95**	1.07
Time to own research	2.7	0.8	3.5	0.9	4.15**	.93
Time to u/g teaching	4.1	0.7	3.4	0.7	4.32**	.91
Time to scholarly writing	2.8	0.8	3.6	1.0	4.00**	.82
Time to p/g supervision	2.7	0.9	3.3	0.9	2.87**	.69
Commitment to teaching	4.2	0.7	3.7	0.7	3.09**	.67
Hours/week worked	47.6	8.6	52.8	9.6	2.52**	.57
<i>Performance in academic roles</i>						
Level of citation	2.0	0.6	3.1	0.9	7.16**	1.45
Articles published	2.2	2.2	5.2	2.7	5.88**	1.22
Number of p/g students	2.0	2.0	3.5	2.6	2.95**	1.16
Grant applications	0.4	0.8	2.2	2.4	5.35**	1.11
Grants obtained	0.3	0.6	1.5	2.2	4.04**	.87
PhD theses examined	0.4	0.6	1.2	1.6	3.47**	.73
Manuscripts in preparation	2.0	1.2	3.4	2.0	4.09**	.54
Difficulty level of research	3.9	0.9	4.2	0.7	1.53	.41
<i>Other measures</i>						
Scholarly reputation	2.8	0.9	3.2	0.9	1.91	.52

Note: **p* < .05, ***p* < .01

sex ratio, disciplinary affiliation, marital status, or whether the person possessed a qualification from a university outside Australia. However, a higher proportion of those who had been promoted (73.8% vs 42.3%) held a PhD degree at the time of the survey, $\chi^2(1) = 8.24$, $p < .01$, and they had completed this qualification at a slightly younger mean age. However, respondents at the level of senior lecturer, reader, or associate professor in 1988 did not differ significantly from those still at the level of lecturer in terms of the mean period of time they had been a PhD candidate. Further, the two groups of academics did not differ significantly in current age, age at completing honours, age at obtaining a tenure-level

appointment, period employed as a tutor before gaining a lectureship, number of children, and age at the time their first child was born. Mean ages at the time of the survey were 45.1 years (SD 5.9) for the academics who had been promoted and 46.9 years (SD 6.6) for those remaining as lecturers. Those promoted had been at their current level of appointment for 4.7 years (SD 2.7), while the mean period of appointment for the lecturers was 13.1 years (SD 6.7).

There were differences on some personality traits between the two groups. As indicated by *d* values of .40 or greater, the respondents who had been promoted from the level of lecturer provided higher mean ratings of themselves as ambitious, aggressive, dominant, and rigorous in their work as an academic than those who still were lecturers in 1988, although some of these differences were not statistically significant. The two groups were similar (the *d* value in each case was less than .40) in terms of the extent to which individuals saw themselves as anxious, authoritarian, defensive, enduring, extroverted, independent, liberal, meek, objective, sociable and supportive in their work as an academic.

The two groups differed in work habits, with the academics who had gained promotion reporting working on average more hours per week (*d* value of .57). The respondents provided ratings on 5-point scales (ranging from "much less" to "much more") of the amount of time they committed to different activities relative to their colleagues. Comparison of mean ratings between the two groups indicated that the academics who had experienced career advancement had a stronger commitment of time to their own research (*d* = .93), to scholarly writing (*d* = .82), and to postgraduate supervision (*d* = .69), but gave less time to undergraduate teaching (*d* = .91). Not only were the academics who had been promoted now supervising a larger number of postgraduate students than the respondents who had remained at lecturer level (*d* = 1.16), but the two groups had differed in terms of the number of postgraduate students they had supervised in 1978 (*d* = .67).

Respondents rated on a 5-point scale ranging from "none" to "all" how many of the leading researchers within Australia in their field of primary interest they knew as personal friends rather than merely as acquaintances. They also rated on 5-point scales covering the range from "much smaller" to "much larger" the extent of their professional network or contact system within Australia and outside Australia relative to other tenured academics in their own discipline. The academics who had gained promotion reported more extensive professional affiliations within Australia (but not overseas) and greater intimacy with leading researchers. They also had attended more international conferences within the preceding five years (*d* = .88).

As can be seen from Table 2, there were significant differences between the academics who were promoted and those who were not in terms of likelihood of having applied for a major research grant (ARC or NH & MRC) in 1976–1978, $\chi^2 = 11.59$, $p < .01$, or 1986–1988, $\chi^2 = 12.45$, $p < .01$. The respondents who no longer were lecturers had lodged more applications for research grants during the three years prior to the survey (1986–1988) than those who remained lecturers (*d* = 1.11) and they had obtained more grants in this period (*d* = .87). They also had published more articles in 1986–1988 (*d* = 1.22). Respondents were asked to rate on a 5-point scale how frequently their publications attracted citation in the

Table 2. Percentage of respondents in the different groups who applied for or held ARC/NH & MRC grants in 1976–1978 and 1986–1988

(Status by 1988)	Lecturer in 1978		Senior Lecturer in 1978	
	Not promoted (N = 26)	Promoted (N = 65)	Not promoted (N = 46)	Promoted (N = 16)
<i>Applied for a grant</i>				
1976–1978	3.8	39.7	42.2	50.0
1986–1988	19.2	59.7	45.5	62.5
<i>Held a grant</i>				
1976–1978	7.7	30.6	41.3	62.5
1986–1988	19.2	39.3	28.3	62.5

scholarly literature. The respondents who gained promotion by 1988 reported higher mean citation levels than those who had remained lecturers over the 10-year period ($d = 1.45$). The number of PhD theses a person had examined also provides an index of scholarly standing. Those who gained promotion had served more often as an examiner within the preceding five years ($d = .73$).

Table 3 shows the percentage of academics in each group reporting that specific circumstances had limited their rate of publication. The respondents who had not advanced beyond the level of lecturer were significantly more likely to identify low research involvement as a factor that restricted publication, $\chi^2(1) = 11.94$, $p < .01$. Although the academics who had not been promoted were also more likely to report that publication had been inhibited by teaching load, family commitments, a change in research area, writer's block, and fear of rejection, the difference in rate of endorsement between the two groups was not significant for any of these variables.

Further data analysis is based on only the measures listed in Table 1 on which the two groups most differed. The objective in undertaking discriminant analysis was to establish the weighted combination of measures that best differentiated

Table 3. Percentages of academics promoted or not promoted between 1978 and 1988 who nominated specific factors as having limited research publication

(Status by 1988)	Lecturers in 1978		Senior Lecturers in 1978	
	Not promoted (N = 26)	Promoted (N = 65)	Not promoted (N = 47)	Promoted (N = 16)
<i>Limiting factors</i>				
Teaching commitments	88.5	60.0	70.2	37.5
Administrative commitments	61.5	76.9	66.0	37.5
Family commitments	64.0	52.3	42.6	18.8
Low research involvement	40.0	9.2	23.9	0.0
Change in research area	26.9	10.8	28.3	6.3
Writer's block	29.2	10.9	17.0	6.3
Fear of editorial rejection	12.0	4.8	12.8	0.0

academics who remained at the level of lecturer from those who were promoted. Colinearity among the 12 measures listed in Table 1 where effect size was .80 or greater was reduced by generating a correlation matrix, identifying each measure that correlated .60 or more with another measure, and retaining in further data analysis the measure from the pair with the larger effect size. This procedure yielded nine measures, each correlating less than .60 with any of the other measures, on which the two groups differed by a magnitude of effect size of .80 or more. The seven measures with largest effect sizes from within this set were then employed as predictor variables in stepwise multiple discriminant analysis. Two of these measures (level of commitment to research, and the number of grants a person had applied for over the preceding three years) did not contribute significantly to differentiation of the two groups of academics after allowance was made for contributions from the other five measures. The five measures that in combination yielded maximum discrimination were the frequency with which the person's publications were cited (standardized canonical discriminant function coefficient of .71), the amount of time the person committed to their own research (.66), the number of leading researchers known as personal friends (.62), the number of PhD students currently being supervised (.60), and the number of articles the person had published over the last three years (.59). Use of the discriminant function based on these five measures permitted the academics who had remained lecturers to be distinguished from those who were promoted with 86% accuracy in the classification of individual cases. A person's status in 1988 was predicted accurately through the discriminant function for 88% of academics who had remained lecturers, and for 85% of academics who had been promoted.

Promotion from senior lecturer level

The sample included 16 academics who were senior lecturers in 1978 and readers or associate professors by 1988 and 47 academics at the level of senior lecturer in 1988 as well as in 1978. As was the case in the preceding analysis, the initial objective is to identify measures on which these two groups of academics most differed. For variables where a categorical response (e.g., "yes" or "no") was required, the groups were compared through chi square tests. Mean responses or ratings were available on other measures. Table 4 reports means and standard deviations for demographic, work habit, networking, personality, and role performance variables where effect size (the standardized difference between means for the two groups) was .40 or greater. In addition, t test values are reported to indicate whether differences in means between groups were statistically significant. The focus in the commentary that follows is on measures where differences between the groups are statistically significant at $p < .01$.

The academics who had gained promotion did not differ significantly from those who had remained at the level of senior lecturer between 1978 and 1988 in terms of age at time of the survey, sex ratio, marital status, number of children, or the age at which their first child was born. The groups were similar in academic background

and training. A similar proportion within each group held a PhD degree, but the academics who gained promotion had on average completed their PhD qualifications at a slightly younger age.

There were differences between the two groups on some but not other personality characteristics. The respondents who had gained promotion rated themselves as more aggressive and ambitious in their roles as an academic. They also rated themselves as more authoritarian and dominant, and as less meek than the academics who had remained at the same level over the 10-year period, but the means on these measures were not statistically significant. Members of the two groups were similar in terms of how anxious, defensive, enduring, extroverted, independent, liberal, objective, rigorous, sociable and supportive they were as academics.

The two groups differed in work habits. The respondents who were at the level of reader or associate professor at the time of the survey committed more time than the respondents who still were senior lecturers to research ($d = 1.02$), to scholarly writing ($d = 1.13$), and to postgraduate supervision ($d = 1.34$). As well as currently supervising more postgraduate students than the respondents who had remained at senior lecturer level ($d = .79$), the academics who had gained promotion indicated they preferred to be supervising even more postgraduate students ($d = .85$). They also provided higher mean ratings in terms of work ethic ($d = .62$) and beginning the work day with objectives to be completed ($d = .72$). The two groups did not differ in their commitment of time to undergraduate teaching.

The academics who had gained promotion from senior lecturer to reader or associate professor reported more extensive professional affiliations outside Australia (but not within Australia) and greater intimacy with leading researchers. In addition, they had attended more international conferences within the preceding three years. In contrast to the comparisons involving lecturers, the academics who were promoted to reader or associate professor did not differ significantly from those who remained senior lecturers in terms of whether or not they had applied for a major research grant (ARC or NH & MRC) in 1976–1978 or 1986–1988 and whether they obtained such a grant in each of these periods of time. However, the readers or associate professors had lodged more applications for research grants during the three years prior to the survey than those who remained senior lecturers ($d = .82$), they had obtained more grants ($d = .89$), and they had published more journal articles ($d = 1.57$). They also currently had a larger number of manuscripts in preparation ($d = 1.17$). In addition, they provided a higher mean rating when asked to assess the level of difficulty of the research on which they currently were engaged ($d = .76$). The respondents who gained promotion by 1988 reported higher mean citation levels than those who had remained senior lecturers over this period ($d = 1.48$), and they had served more often as an examiner of PhD theses within the preceding five years ($d = .62$).

The academics who had been promoted reported a higher level of job satisfaction than those who had remained at senior lecturer level, $t(62) = 3.12$, $p < .01$, they had less often contemplated a career shift, $t(62) = 4.09$, $p < .01$, and they

Table 4. Mean scores on demographic, personality, work habits, role performance, and other measures, together with group comparisons (t test values) and effect-sizes (d values), for academics who were senior lecturers in 1978 and had been either not promoted or promoted by 1988

(Status by 1988)	Not promoted (N = 47)		Promoted (N = 16)		t	d
	M	SD	M	SD		
<i>Demographic variables</i>						
Age at completing PhD (years)	33.2	8.5	28.9	4.5	2.57**	.67
Current age (years)	52.4	5.5	49.0	6.2	1.94	.59
<i>Personality characteristics</i>						
Ambitious	2.6	1.1	3.6	1.1	3.14**	.91
Meek	2.3	1.2	1.5	0.6	3.47**	.88
Dominant	2.0	0.9	2.6	1.3	1.71	.56
Aggressive	2.1	1.1	2.7	1.2	1.76	.51
Authoritarian	1.7	0.9	2.2	1.2	1.53	.47
<i>Affiliations</i>						
Extent of network outside Australia	3.2	1.3	4.1	1.0	2.87**	.78
International conferences	1.4	1.7	2.7	2.0	2.33**	.72
Leading researchers as friends	3.1	1.1	3.6	1.1	1.59	.44
<i>Work Habits</i>						
Time to p/g supervision	3.0	1.1	3.8	1.3	2.23**	1.34
Time to scholarly writing	3.1	0.9	4.1	0.8	4.18**	1.13
Time to own research	3.1	0.9	4.1	0.9	3.83**	1.02
Start day with objectives	3.2	1.1	4.0	1.1	2.54**	.72
Commitment to research	3.3	1.0	3.9	0.8	2.42*	.66
Time with family	2.7	1.1	3.4	1.4	1.83	.63
Work ethic	3.5	0.9	4.0	0.8	2.09*	.62
Time to administration	2.8	1.3	3.6	1.1	2.39*	.58
Hours/week as academic	51.8	8.9	57.1	12.9	1.52	.48
<i>Performance in academic roles</i>						
Articles published (N)	3.6	2.7	7.2	1.9	5.83**	1.57
Level of citation	2.8	0.9	4.0	0.7	5.49**	1.48
Manuscripts in preparation (N)	2.4	1.3	4.4	2.2	3.44**	1.17
Grants obtained (N)	1.1	1.7	2.9	2.4	2.77**	.89
Grant applications (N)	1.7	2.1	3.7	2.7	2.70**	.82
Number of p/g students (N)	2.5	2.4	4.5	2.7	2.63*	.79
Difficulty level of research	3.9	0.8	4.5	0.6	3.16**	.76
Chapters in books (N)	1.2	1.6	2.6	2.4	2.17*	.71
PhD theses examined (N)	1.6	1.5	2.5	1.4	2.18*	.62
Conference reports (N)	2.3	2.4	4.0	3.5	1.80	.57
<i>Other measures</i>						
Contemplated career change	2.5	1.4	1.4	0.7	4.09**	1.36
Job satisfaction	3.2	0.7	3.9	0.8	3.12**	.94
Scholarly reputation	3.2	0.8	3.7	0.6	2.63*	.81
Would continue beyond 65	2.4	1.4	3.3	1.4	2.50*	.61

Note: *p < .05, **p < .01

expressed greater interest in retaining a university appointment beyond age 65, $t(62) = 2.50, p < .05$.

Table 2 shows the percentage of academics in each group reporting that specific circumstances had limited their rate of publication. Although 24% of respondents still at the level of senior lecturer reported that their output had been restricted by low involvement in research, none of those promoted to reader or associate professor identified this basis. The academics who had not been promoted were also more likely to report that publication had been inhibited by teaching load, family commitments, a change in research area, writer's block, and fear that manuscripts they prepared would not be accepted for publication.

Multiple discriminant analysis was next employed in order to identify the weighted combination of variables that best differentiated the academics in the sample who continued as senior lecturers between 1978 and 1988 from those who had advanced to the level of reader or associate professor. The predictor variables in the discriminant analysis were the measures listed in Table 4 on which the two groups most differed. Colinearity among the 13 measures where effect size was .80 or greater was reduced by identifying a measure that correlated .60 or greater with another measure, and retaining in further data analysis only the measure from the pair with the larger effect size. This procedure yielded 10 measures, none correlating more than .60 with another measure, for which the magnitude of effect size was .80 or greater. The seven measures with largest effect size were then employed as predictor variables in stepwise multiple discriminant analysis. Three of these measures (time committed to writing, time committed to postgraduate supervision, current job satisfaction) did not contribute significantly to differentiation of the two groups of academics after allowance was made for contributions from the other four measures.

The four measures that in combination yielded maximum discrimination between academics promoted to a readership and those remaining a senior lecturer were the frequency with which a person's publications were cited (standardized canonical discriminant function coefficient of .67), number of articles published over the last five years (.51), number of grants obtained by a person over the past three years (.43), and whether a person had contemplated a career change (-.68). Use of the discriminant function based on these four measures permitted the academics who were senior lecturers in 1978 and 1988 to be distinguished from the academics promoted to the level of reader or associate professor during this period with 86% accuracy in the classification of individual cases. A person's status in 1988 was predicted accurately through the discriminant function in 84% of cases where academics had remained senior lecturers, and in 86% of cases where academics had been promoted.

Discussion

The analyses demonstrate for academics in Australian universities that career advancement was associated not only with demographic variables, but with

personality characteristics, work habits, and level of performance in academic roles. All academics in the sample held appointment over the 10-year period from 1978 to 1988, and those who had not gained promotion by 1988 would by then have remained for several years at the top level of their salary scale. Although the variables associated with promotion from lecturer and promotion from senior lecturer were not identical, the profiles were similar. Relative to the respondents who had not been promoted, the academics who gained promotion were the more likely to hold a PhD degree, to have obtained this qualification at a younger age and over a shorter period of candidature, to rate themselves more highly on achievement-oriented traits. They had more extensive professional networks and were more likely to attend international conferences. They gave priority in allocating time to activities such as research, scholarly writing, and postgraduate supervision, they applied for and obtained more research grants, they published more often, and their publications were more frequently cited in the literature. These different characteristics were intercorrelated. Multiple discriminant analysis demonstrated a high level of accuracy in prediction of whether or not an academic had been promoted. The primary discriminating variables in the case of those who had been lecturers in 1978 were publication rate, citation frequency, commitment of time to research, the number of leading researchers known as personal friends. For respondents who had been senior lecturers in 1978 the primary discriminating variables were publication rate, citation rate, the number of grants obtained, and whether the person had contemplated a career change.

In interpreting these results, it must be recognized that the analyses were based entirely on self-report measures. The procedures used in guaranteeing anonymity made it impossible to check the extent to which information provided by respondents was accurate. Measures for some of the variables that proved to be most discriminating (e.g., publication rate, citation level, number of research grants) can readily be obtained from the public record, and it would be interesting to establish whether career advancement is predicted by these measures to the same extent as demonstrated for the self-report measures used in the present study. Objective performance indicators such as publication rate, citation level, and research grants may reflect processes such as work ethic and selective allocation of time across academic roles, which do not form part of the public record, and these processes may in turn be regulated by personality traits. A question of interest is whether the understanding of career advancement and different aspects of the work of an academic is enhanced by knowing more about processes that do not form part of the public record. Possibly the level of redundancy between measures is such that predictive power will not be increased by taking work habits and personality traits into account after the contribution from public-record data has been established.

The personality traits that were associated with career advancement are those that Rushton *et al.* (1983) identified as reflecting the extent of commitment by academics to research as opposed to teaching. The respondents who had gained promotion rated themselves as more aggressive, ambitious, authoritarian, dominant, and rigorous, as well as less meek, in their roles as an academic, although on a number of these measures the differences in means between groups were not

statistically significant. The academics who gained promotion also rated themselves more highly on work ethic and work habits such as pursuing difficult research problems, beginning the day with defined objectives, and working more hours per week. These measures have themselves been shown to predict research output and impact (see Fox 1983). For example, Helmreich *et al.* (1980) showed that the publication rate and citation rate of social psychologists reflected work (indexed by responses to questions such as, "I like to work hard"), mastery (a stated preference for difficult tasks), and competitiveness, while Matthews *et al.* (1980) found that citation levels correlate positively with Type A personality (a measure of work pace and striving for achievement).

Moses (1986) noted that academics perceive the promotion processes within Australian universities as giving much greater weighting to research achievement than to commitment to teaching. The present results suggest that beliefs held by academics about the nature of the incentive and reward system within universities are accurate. Career advancement was associated primarily with measures of research achievement. In terms of ratings provided by the respondents, academics who gave priority to teaching over research were disadvantaged in terms of promotion. The lecturers who had not gained promotion rated themselves as having a higher commitment to teaching (d value of .67) and as allocating more time to undergraduate teaching ($d = .91$) than the lecturers in the sample who were promoted. Further, lecturers who had not been promoted (89% vs 60%) and senior lecturers who had not been promoted (70% vs 38%) were more likely than academics who had been promoted to identify teaching commitments as a factor that had limited rate of publication. These differences in teaching commitment were established through self-report measures completed as part of a survey where anonymity was guaranteed. It would be interesting to determine whether similar differences would be found in comparisons where a person's commitment to teaching is assessed by colleagues or students rather than by self-report. The issue of effectiveness in teaching should also be addressed.

The results of the present study highlight the extent to which the reward and incentive system within the Australian universities, at least in the period between 1978 and 1988, gave priority to research achievement. In this context it is interesting to note the observation by Dunkin (1990), from study of lecturers who took up appointment in 1981–1984, that, "Lecturers accepted (teaching) as one of their professional responsibilities and some had taken action to learn more about it, but teaching tended to be seen as a 'chore', and, to some, an obstacle that inhibited their research" (p. 64). Even though some universities have committed substantial resources to improving teaching through staff development (Johnson 1982), have required applicants seeking promotion to provide evidence of teaching prowess (see Moses 1986), and recognize excellence in teaching through awards, the results from the present study show that career advancement was associated with achievement in research rather than commitment to teaching.

It will not necessarily be the case that the criteria governing the promotion of academics in Australian universities will remain the same in the 1990s as in the past. Government policy directives (see Dawkins 1988) have produced a unified

national system in Australian higher education in place of the binary system that previously prevailed. The consequence has been amalgamation between institutions, typically with colleges of advanced education becoming part of existing universities or combining to form a new university (see Mahony 1992). Universities traditionally were funded for research activity and postgraduate training in addition to undergraduate teaching, whereas the traditional role of the college of advanced education sector was to provide diploma and undergraduate degree programs in areas of professional training such as education, applied science, and business studies. Administrative responsibility and excellence in teaching were the primary criteria for promotion within the college of advanced education sector. Ramsden and Moses (1992), in a survey of academics who had worked in different sectors under the binary system, found that academics who had been employed in a college of advanced education overall reported higher levels of commitment to teaching and lower rates of involvement in research than academics from the traditional universities. Further, across the sample as a whole there was almost no association between the commitment of academics to teaching and their involvement in research.

“Comprehensive” universities formed through amalgamation may well combine the different functions and roles of the two sectors of the former binary system (see Mahony 1990), and adopt promotion criteria and processes that recognize a more diverse range of competencies and achievements than has traditionally been the case in Australian universities. In future there thus may be multiple paths for career advancement in Australian universities. An alternative is that the orientation that distinguished the college of advanced education sector in the binary system will be devalued in the unified system. In commenting on the unified system in Australian universities, Meek (1991) suggested, “There is a mystique attached to the very name ‘researcher,’ and to be denied access to the title will lead to two classes of institutions and two classes of academics within institutions: researcher and non-researcher, with status, prestige, and wealth allocated accordingly . . . If status, wealth, and prestige are directly linked with research, with little or no avenue to gain an advantageous position in the hierarchy without a research function, then the result probably will be rampant institutional imitation” (p.477). In terms of this scenario, career advancement under the unified system will reflect performance at research, even in universities formed by amalgamation of former colleges of advanced education. This was the expectation held by the teacher educators whom Mahony and Over (1993) surveyed in 1991. Teacher educators who had previously worked within the college of advanced education sector believed that career advancement in the unified system will be more dependent on research achievement than excellence in teaching.

It will be useful to monitor the promotion criteria employed by Australian universities in the 1990s, and in particular establish whether universities formed by amalgamation of former colleges of advanced education adopt criteria different from those applying within the traditional universities. The processes underlying evaluation of applications for promotion (e.g., the extent committees seek information about teaching effectiveness) also merits attention. A further issue, and

one that has so far received limited attention, is the impact that promotion criteria emphasising research achievement have on the commitment of academics to teaching and to their effectiveness as teachers. Ramsden and Moses (1992), in a survey of Australian academics, found that commitment to teaching was overall unrelated to level of involvement in research, although a category of academics in the traditional universities who were highly active in research and committed to teaching was identified. Possibly a change in promotional criteria (such as requiring distinction in teaching in addition to research) would lead more academics to give greater priority to teaching, and result in a higher correlation between commitment to teaching and involvement in research.

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