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Participation in and progress through  
new apprenticeships

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# Longitudinal Surveys of Australian Youth

## Research Report Number 44

### Participation in and Progress through New Apprenticeships

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November 2005

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## EXECUTIVE SUMMARY

New Apprenticeships provide a pathway from school to adult working life for a significant proportion of each cohort of young people and thus make a potentially important contribution to the formation of skills for individuals and for the community as a whole. New Apprenticeships are based on a formal combination of study and work that links learning in the workplace with learning in an educational institution. They incorporate both traditional apprenticeships and traineeships. This report focuses on two broad research questions:

- What are the characteristics of young people who commence a New Apprenticeship overall, as well as of those in traditional apprenticeships or traineeships separately and those in different fields of training?
- What are the points of entry to and patterns of progress through New Apprenticeships?

### Data

The report uses longitudinal data from the Y95 cohort of the Longitudinal Surveys of Australian Youth (LSAY), a nationally representative sample of young people from Year 9 in 1995, to investigate patterns of participation in and progress through New Apprenticeships. The Y95 cohort has been followed for sufficient time to allow analysis of their persistence in and completion of these qualifications.

### Participation

One in every five members of the cohort that was in Year 9 in 1995 (and thus would have been in Year 12 in 1998) participated in a New Apprenticeship by the end of 2003. In terms of personal background, participation in a New Apprenticeship was higher among males than females, those of an English-speaking background than other students, those from non-metropolitan than metropolitan backgrounds, those whose father worked in a skilled trade than others, those with above average trade-related interests, and those in the lowest three quarters of family socioeconomic status compared to the highest quarter. Of this cohort 11.5 per cent of the cohort was serving a traditional apprenticeship and 9.5 per cent were undertaking a traineeship.

#### *Traditional apprenticeships*

Males were three times as likely as females to participate in traditional apprenticeships (even after allowing for differences in other factors such as interests). Participation was also higher among young people

- of an English-speaking background;
- whose father was a tradesman;
- with lower achievement in reading and mathematics in Year 9;
- with greater interest in trade-related activities;
- who left school before Year 12;
- who studied a VET subject in Year 12 compared with doing Year 12 without VET; and
- who came from a school with a strong level of enrolments in technology subjects.

## *Traineeships*

Participation in traineeships was more evenly distributed across the cohort than was the case for traditional apprenticeships. However, females had a higher likelihood than males of participating in a traineeship, students with lower levels of achievement in reading in Year 9 were more likely to participate in a traineeship, and students from non-metropolitan locations were more likely to participate in traineeships. Undertaking Year 12 with a VET subject included resulted in an increased likelihood of traineeship participation over completing Year 12 without a VET subject.

## **Progress through New Apprenticeships**

Most New Apprentices began in the same year as they completed school or in the following year. More than three-quarters of apprentices began their training within a year of finishing at school. For trainees there was sometimes a gap between school and training.

By 2003, 74 per cent of traditional apprentices had completed, 16 per cent had discontinued, and 10 per cent were continuing. These completion rates are higher than those estimated by NCVER, possibly because they refer to those who commenced apprenticeships after leaving school in their late teens and possibly because they refer to those who commenced in the mid 1990s, as opposed to those who completed in the early to mid 2000s. In addition, the analysis of longitudinal data may estimate higher completion rates than administrative data because those who do not complete an apprenticeship are more likely to have discontinued in the survey and because longitudinal data can capture information about transfers within apprenticeships and courses of training. There was no difference in completion between those who had completed Year 12 and those who had not completed Year 12. Completion data for trainees are more difficult to analyse because self-reported completions may not be accurate.

There were differences among fields of training in the percentages that discontinued their training. Higher percentages discontinued in hairdressing and food and hospitality than in other fields. However, none of the other personal and educational background characteristics that were investigated were associated with discontinuation.

Reasons given for not continuing a New Apprenticeship most frequently focused on personal issues such as dislike of the type of work, getting along with supervisors or others at work, being offered a better job or feeling that the pay was too low. The difficulty of study, future job prospects or the nature of the on or off the job training were not key reasons for discontinuing a New Apprenticeship.

## **Conclusion**

Several conclusions from this report have relevance to considerations of the ways in which New Apprenticeships contribute to the skilled labour force. It suggests that expanding entry numbers may be as important for expanding output from the system as improved completion rates. There are probably limits to improving completion rates (even allowing for the uncertainties of estimation those rates) since non-completion is more related to the workplace circumstances and changed interests than it is to entry characteristics. As Year 12 completers form the majority of each cohort and participation amongst early school leavers is already relatively high, there appears to be more scope for expansion through encouraging participation among those who complete Year 12 than among those who leave

school before Year 12. However, encouraging participation among early leavers in New Apprenticeships has been argued to have benefits for equity in education and training. Participation among those who complete Year 12 will be enhanced through the experiences and advice provided in the earlier years of school that shape interests and by curriculum provisions in the senior years through technology studies and vocational education and training.



# Participation in and Progress through New Apprenticeships

## 1

### INTRODUCTION

New Apprenticeships are based on a formal combination of study and work that links learning in the workplace with learning in an educational institution. They incorporate both traditional apprenticeships and traineeships. This research report uses longitudinal data from the Y95 cohort of the Longitudinal Surveys of Australian Youth (LSAY), a nationally representative sample of young people from Year 9 in 1995, to investigate patterns of participation in and progress through New Apprenticeships. Members of the Y95 cohort were entering apprenticeships or traineeships around the time or just before the New Apprenticeship initiative was implemented. As such, respondents were not asked about whether they were undertaking 'New Apprenticeships' but rather were asked about 'apprenticeships' or 'traineeships'. The Y95 cohort provides the best dataset to analyse characteristics of those who enter into apprenticeships or traineeships (now collectively termed 'New Apprenticeships') as they have been followed for enough years to allow analysis of their persistence in and completion of these qualifications. The analysis contributes to knowledge about the factors that influence young people to enter an apprenticeship or traineeship and factors that affect their progress.

This report focuses on two broad research questions:

- What are the characteristics of young people who commence a New Apprenticeship overall, as well as for traditional apprenticeships or traineeships separately and in different fields of training?
- What are the points of entry to New Apprenticeships and what are the patterns of progress through apprenticeship?

The members of the sample of young people from Year 9 in 1995 provided information about their educational and social background, achievements, attitudes and vocational interests at that time. Their educational and occupational activities were traced every year through to 2003. Approximately 20 per cent participated in a New Apprenticeship during this period and they are the focus of the report.<sup>1</sup>

#### **Context**

Several aspects of the context in which New Apprenticeships emerged are relevant to this investigation: the perceived benefits, the recent history surrounding their emergence, requirements for skilled labour and levels of participation.

#### *Perceived benefits*

Combining work, education and training in a structured manner is seen to have benefits for the community and for individuals. In terms of community benefits, traditional apprenticeships have long been central to the training and skill formation process in Australia. In 1977 the OECD observed that the apprenticeship system had served Australia

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<sup>1</sup> Some additional information is provided about another group of more than 7700 young people who had been in Year 9 in 1998.

well and should not be lightly discarded (OECD, 1977). New Apprenticeships have extended these principles to other fields of training and have invoked new formats for combining institution-based and workplace-based learning. In terms of benefits to the individual, Raffe (2003) argues that apprenticeships provide skill formation through linking theoretical and applied learning, fostering links between training and practice, socialising young people into the workplace and acquiring an occupational identity. In many countries apprenticeships appear to result in higher levels of employment (especially for males), although the magnitude of the benefit varies according to national context (Raffe, 2003). Learning and skill formation through New Apprenticeships envisage the workplace as a place of learning (Harris, Simons, Willis & Carden, 2003). On-site and off-site learning are both important in New Apprenticeships, and the principle of gaining labour market experience at the same time as learning attracts young people who prefer practical styles of learning.

### *Recent history*

In the early 1990s numbers of apprenticeship commencements declined and there were questions about the capacity of this traditional mode of training to provide the appropriate skills for a modern economy that was based on a wider range of emerging jobs (Smart, 2001). Traineeships had been introduced in the mid 1980s to provide entry level training in a wider range of fields and formats (Kirby, 1985) but had not become established as an equivalent form of workplace-based training (Smart, 2001). The apprenticeship system in Australia underwent changes during the middle 1990s as part of the training reform agenda (Ray, 2001). The most notable of these changes was the inclusion of traineeships together with traditional apprenticeships as part of the New Apprenticeships (Ray, 2001; Saunders, 2001). New Apprenticeships were introduced in 1998 and spanned a wider range of fields and incorporated more flexible arrangements for training than was previously the case for traditional apprenticeships.

It is important to recognise that the cohort of young people that is the focus of this report mostly entered post-school education and training at the end of 1996 (after Year 10), 1997 (after Year 11) or 1998 (after Year 12). In other words, they entered traineeships and apprenticeships, the antecedents of New Apprenticeships, and recognised those terms as describing what they did. At that time apprenticeships and traineeships represented forms of training that were distinguished by their duration, qualification level and field of training. Traineeships were predominantly of one year's duration and traditional apprenticeships were predominantly of four years' duration and resulted in an AQF Level III certificate. There were also substantial differences in the characteristics of those who enrolled in apprenticeships compared to those in traineeships. Apprentices were predominantly male, young and employed full-time. Since 1999 these distinctions have become less marked as New Apprenticeships have been implemented, but the terms 'apprentices and trainees' are still used in many publications (NCVER, 2004).

### *Skilled labour requirements*

Since 2003 there has been renewed interest in apprenticeships in relation to the demand for personnel in skilled trades. It is recognised that personnel demand is made up of growth demand (a field is expanding and generating a demand for personnel) and replacement demand (the field is not expanding but there is a need to replace departures from the field) (Shah & Burke, 2003). It is argued that in many skilled trades there is an emergent replacement demand as a consequence of the age distribution of those currently employed

(Dusseldorp Skills Forum, 2003). Although judgements about demand for personnel in particular fields are difficult to establish with precision, there appears to be agreement that shortages in skilled trades are emerging in some industries and that the current rate of training is not likely to satisfy that demand (Toner, 2003). A report by the Australian Industry Group argues that there is a shortage of skilled tradespeople in the manufacturing industry and that an expansion of apprenticeships is one element that is necessary to redress the shortage (AIG, 2004).

### *Participation levels*

Apprenticeships have long been a significant part of the education and training system in Australia. Long, Carpenter and Hayden (1999) estimated that 23 per cent of males and 7 per cent of females born in 1975 had participated in an apprenticeship by the time they had reached 19 years of age. Since the middle 1980s traineeships extended features of apprenticeship training to a wider range of industries, and since the late 1990s both apprenticeships and traineeships have provided the foundation of New Apprenticeships. NCVER estimated the number of completions of apprenticeships and traineeships in 2003 as 126,900 (NCVER, 2004). In comparison, there were just a few more than 101,000 domestic undergraduate completions from universities in 2003 (DEST, 2004). The growth in the numbers for New Apprentices from 1996 to 2002 was largely a result of growth in traineeships (and other non-traditional apprenticeships), with little change in the numbers participating in traditional apprenticeships (NCVER, 2003). Traditional apprentices now make up around one in three (31 per cent) of all apprenticeships and traineeships (NCVER, 2004). There has also been an associated shift in the distribution of New Apprentices across occupational groups. In 1996, 75 per cent were in the group 'tradespersons and related workers', but by 2001 the percentage in this classification had declined to 39 per cent (Brooks, 2004). Over recent years, enrolment growth has been stronger among those aged 25 years and older than among those younger than 25 years (NCVER, 2004). In 1996, 87 per cent of New Apprentices were younger than 25 years, but by 2003 the percentage had dropped to 54 per cent (NCVER, 2004).

### **Related Research**

There is a body of research that relates to the characteristics of participants in and the patterns of progress of those participants through New Apprenticeships. Some of this research involves studies of those who enter apprenticeship, and other research involves a consideration of how the form of training impacts on entry and progress.

### *Apprentice characteristics*

Research from the early 1980s suggests that young men entering apprenticeships in traditional areas had relatively higher performance in numeracy and relatively poorer performance in literacy (Ainley & Clancy, 1983). A preponderance of these entrants came from the families of skilled tradespeople. Possibly, the experience of growing up in a home environment generates an interest in trades-related activities, or parents who are themselves working in skilled trades are able to provide contacts with potential employers (Ainley, Elsworth & Fullarton, 2001). Similar perspectives have emerged from other studies (Ball & Lamb, 2001; Long, Carpenter & Hayden, 1999). Ball and Lamb (2001) reported that a trade course was a common destination for males who left school before completing Year 12 and that the profile of participants in trade courses tended to be evenly distributed across socioeconomic groups.

### *Training experiences*

Harris, Simons, Willis and Carden (2003) argued that an important aspect of developing as a tradesperson was a capacity to integrate and synthesise the different messages from on-site and off-site environments. Other studies have shown that although on-site learning has the potential to facilitate deeper understanding and immersion in work processes, there is considerable variation in the extent to which this potential is realised (Billett, 1996). Smith (2004) used qualitative data gathered from people in their first year of full-time work to examine the nature and quality of the off-site training they had experienced. She concluded that off-the-job training was extremely important in complementing workplace learning.

### *Progress through apprenticeship*

Several research studies show that withdrawal from apprenticeship tends to occur most frequently in the first year of training (Cully & Curtain, 2001; Harris et al., 2001; Lamb et al., 1998). Bender (2003) suggested training courses with high completion rates were more likely to be full-time, in trades and with government employers. Cully and Curtain (2001) also found that non-completions were higher among trainees than among apprentices and that non-completion was frequently associated with workplace issues. As a result of a comprehensive study of apprentice and trainee completions based on administrative records, Ball and John (2005) indicate an overall low completion rate of 60 per cent but with variations related to characteristics of participants and their training courses. Traditional apprentices had completion rates of between 71 per cent for those entering apprenticeships in 1995 and 60 per cent for those entering apprenticeships in 1999. Over the same period trainees had completion rates that rose from 47 to 52 per cent for corresponding entering cohorts. The study also found that completion rates were higher for those apprentices and trainees who had completed Year 12 than for those who had not completed Year 12, and were higher for those who were aged 19 years or younger than for those who were aged 20 to 24 years at the time they commenced their training (Ball & John, 2005). Completion rates were also higher for higher level vocational qualifications (AQF III and IV) compared to lower level vocational qualifications (AQF I and II), with the difference being almost 10 percentage points (Ball & John, 2005, p. 24). Completion rates were also reported to be higher for courses of three and four years' duration than for courses of shorter duration, and for those who were employed full-time rather than part-time (Ball & John, 2005). Ball and John (2005) estimate an overall completion rate of 60 per cent for those who commenced courses of training between 1997 and 1999, with their detailed analysis suggesting that completion rates of 70 per cent or more for young entrants to traditional apprenticeships result in higher-level vocational qualifications and in full-time employment.

### *Apprenticeship outcomes*

In Australia, the *Student Outcomes Survey* conducted of TAFE graduates from 2001 showed that 86 per cent of apprentices, compared to 48 per cent of trainees, completed an AQF level III or higher qualification (NCVER, 2003, p. 14). Moreover, following course completion 65 per cent of apprenticeship graduates were employed with the same employer and only 8 per cent were unemployed. In comparison, 55 per cent of traineeship graduates were employed with the same employer and 18 per cent were unemployed. Previous analyses of data from the Longitudinal Surveys of Australian Youth (LSAY) have also indicated that those young people who had completed an apprenticeship had

substantially lower rates of unemployment than other young people (Marks & Fleming, 1998; Marks, Hillman & Beavis, 2003).

### *Summary*

Although there is a growing body of research concerned with New Apprenticeships, relatively little of this research uses longitudinal data from nationally representative samples. Analysis of longitudinal data can add to existing knowledge about the factors that influence young people to enter a New Apprenticeship, and affect their progress through New Apprenticeships. This is especially true in relation to the influence of previous achievement at school and patterns of interests while at school.

### **The Report**

This report is structured around an examination of participation in and progress through New Apprenticeships. The data on which this report is based derive from young people who were in Year 9 in 1995. In other words, their entry to apprenticeship pre-dated the introduction of New Apprenticeships, so much of this report uses terminology that was still used by young people at the time the data were collected. One purpose of this report is to examine participation in apprenticeships and traineeships and the relationship of students' educational and social backgrounds to choosing to enter an apprenticeship or traineeship. A second purpose is to use longitudinal data to examine points of entry to and progress through apprenticeships and traineeships. In other words, it considers who enters these forms of training, from what entry points and how they progress through their initial training.

The report is structured into six chapters. Chapter 2 outlines some issues of methodology related to the data and the analyses that were conducted. Chapter 3 provides a description of the characteristics of New Apprentices, and Chapter 4 reports the results of multivariate analyses that highlight influences on participation in these forms of training. Chapter 5 describes patterns of entry to and progress through New Apprenticeships and examines characteristics associated with discontinuing a course of training. Chapter 6 interprets the results in terms of the factors that influence participation and progress.

## 2

### DATA AND ANALYSIS

This report focuses on New Apprenticeships. It is the second report in a series of three LSAY reports which examine the participation in and progress through post-school education pathways. The other two reports deal with course transfer and attrition in higher education (McMillan, 2005) and participation in, and progress through, non-apprenticeship TAFE courses (McMillan, Rothman & Wernert, forthcoming). This report addresses two sets of research questions. The first set relates to the participation of young people in an apprenticeship or traineeship, studying the characteristics of those young people. The second set of questions concentrates on progress in and completion of an apprenticeship or traineeship.

#### Research Issues

Within each of the general research issues some more specific questions are addressed. In terms of the characteristics of young people who commenced a New Apprenticeship the report investigates:

- the relative strengths of the associations of socio-demographic and educational characteristics with participation in New Apprenticeships;
- the differences in the factors associated with participation in different forms (apprenticeships and traineeships) and fields of training; and
- the extent to which previous school experiences are associated with the uptake of New Apprenticeships.

In terms of the points of entry to New Apprenticeships and patterns of progress the report investigates:

- the proportions of young people who entered New Apprenticeships direct from school and the proportions who entered after a period in the workforce or the experience of another form of post-compulsory education;
- the proportions of young people who entered New Apprenticeships after Year 10, Year 11 or Year 12, and whether those proportions differ between forms and fields of training; and
- the proportions of entrants to New Apprenticeship courses who remained to complete their course.

#### Data

Data from a nationally representative sample of young people who were in Year 9 in 1995 formed the basis of this investigation. This sample was one of the cohorts of the Longitudinal Surveys of Australian Youth (LSAY). These young people were sampled from approximately 300 Australian secondary schools representative of State, sector and location. Details of the sample are provided in the Appendix.

In the first year of the survey the participants completed two achievement tests, one in reading comprehension and one in mathematics. In addition, they completed questionnaires on family background, school and work aspirations, and attitudes toward school. In the following year cohort members were contacted by mail and asked to complete and return a

questionnaire. Participants provided information on school, work, post-school plans and, if they had already left school, post-school activities. Beginning in the third year, cohort members were contacted by telephone annually. During these interviews, cohort members provided information on work, study, attitudes, aspirations, relationships, living situations and other activities.

These data were used to determine who participated in an apprenticeship or traineeship and some other aspects of the course of training that was undertaken. Although LSAY was not specifically concerned with apprenticeships and traineeships, the data did contain details of the training experience. The numbers were sufficient to analyse overall patterns, but were limited in the extent to which they could provide information for particular fields of training.

## **Variables**

For most of the analyses the dependent variables concerned participation, or persistence, in a New Apprenticeship.<sup>2</sup> It was possible to track entry to apprenticeship at any point following Year 10, 11 or 12. The full range of data from the LSAY surveys was available for use in the analyses (see Appendix). Variables specifically related to apprenticeships and traineeships were constructed.

### *Field of training*

A classification of ‘field of training’ was constructed from respondents’ indications of the field in which they were studying and supplemented by information about the industry in which they were working. Apprentices and trainees were classified into different fields of training: electronics, engineering and automotive, building, agriculture, food and hospitality, hairdressing, community services, as well as health and business. These categories were similar to those reported in NCVER statistics and represented the key industries that employed New Apprentices. They also reflected different skill and interest requirements and enabled a consideration of the different pathways and background characteristics of individuals in different fields of study.

### *Commencement and progress*

LSAY data provided indicators of commencement in and progress through a course of training. In terms of commencement, the data indicated the stage of schooling attained prior to commencing the training and the time that had elapsed between leaving school and commencing training. School attainment was categorised as a dichotomy: Year 11 and below or Year 12. Progressive status over successive years was characterised as continuing, completed, withdrew or time-out. Some of the analyses in this report focus on the dichotomy between those who were either continuing or had completed (given other research that indicates most discontinuation is in the first year) and those who had discontinued.

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<sup>2</sup> Throughout the report the term persistence is used to refer to the extent to which New Apprentices continue through the course. At any point such people are classified as *continuing* or *completed*. The term *discontinued* is used to refer to those who have withdrawn from the apprenticeship or had the apprenticeship cancelled.

### *Personal and social background*

There were data available about the personal and social background of the participants, including sex, parental occupation and educational background, ethnicity (language background and country of birth of parents), geographic location and State or Territory. Thus it was possible to examine the correlates of entry to apprenticeship or traineeship and map them against stage of entry. Data were also available concerning vocational or career interests (see Appendix).

### **Analysis**

Analyses were conducted to generate descriptive statistics and measures of association between participation in New Apprenticeships and characteristics of young people and their schools. In addition, a logistic regression analysis was conducted to investigate influences on participation in apprenticeships and traineeships. This form of analysis is the appropriate analysis to provide an indication of net influences (that is, the influence of one factor on the outcome under conditions when other associated influences are held constant) on an outcome that is dichotomous (for example, participated or did not participate).

There was an analysis of entry points (years of school completed and the period between completing school and starting a New Apprenticeship) overall and for each field of training. LSAY data were then analysed to examine status in New Apprenticeship at the latest point possible and relate that status to various entry characteristics.

### **Summary**

The data for this reported are based on data from the Y95 cohort of the Longitudinal Surveys of Australian Youth (LSAY), a nationally representative sample of young people from Year 9 in 1995. These data were compiled as the young people progressed from that point onwards to 2003, with the focus being on those who participated in a New Apprenticeship. A major advantage of these data is that they are longitudinal, so it is possible to trace influences on participation and progress in a proper way. In order to address the research questions concerned with participation in and progress through New Apprenticeships, a number of variables were constructed from the data that were available. The data were used to support analyses that generated unadjusted measures of association and multivariate analyses.

## 3

## CHARACTERISTICS OF NEW APPRENTICES

Other research on New Apprenticeships suggests that several aspects of social, personal and educational background are likely to influence participation. This section uses longitudinal data to investigate the extent of various influences on participation. Participation was defined as ever having been engaged in a New Apprenticeship. For some analyses a comparison between apprentices and trainees has been reported.

### Social and Personal Background

The background characteristics by training status for the 1995 Year 9 LSAY cohort are provided in Table 1.

**Table 1 Selected personal and social background characteristics of New Apprentices from the 1995 Year 9 LSAY cohort**

	New Apprentices			Other	Total cohort
	Apprentice	Trainee	All		
	%	%	%	%	%
<b>Sex</b>					
Male	84	39	62	45	49
Female	16	61	38	55	51
<b>Father's occupation</b>					
Professional/managerial	31	37	34	43	41
Sales/clerical/service	11	15	13	13	13
Skilled trade	36	24	31	22	23
Semi or unskilled	21	25	23	22	23
<b>Father's education</b>					
Higher Education	16	16	16	29	26
Trade/Technical	33	23	29	22	23
Complete secondary	15	20	17	17	17
Did not complete secondary	36	41	38	32	33
<b>Home language background</b>					
English	97	96	96	87	89
Language other than English	3	4	4	13	11
<b>Location in Year 9</b>					
Metropolitan	46	42	44	58	55
Regional	29	29	29	23	24
Rural and Remote	25	29	26	19	21
<i>Number</i>	<i>790</i>	<i>640</i>	<i>1430</i>	<i>5446</i>	<i>6876</i>

Notes: Those participants who had undertaken both an apprenticeship and a traineeship have, for the purposes of this table, been classified as apprentices. Because of rounding columns may not add to 100%.

Table 1 indicates that New Apprentices were less likely to be from families where the parents were in professional and managerial occupations or had completed a higher education qualification than other young people in the cohort. They were less likely to come from language backgrounds other than English, and they were more likely to come from non-metropolitan locations. Table 1 shows the distribution of specified characteristics

within each group. Another perspective is to consider the percentage of each demographic group that participated in a New Apprenticeship. From this perspective, participation in a New Apprenticeship was higher among

- males than females (27% compared to 15%);
- those of an English-speaking background than other students (22% compared to 10%);
- those from non-metropolitan than metropolitan backgrounds (26% compared to 18%);
- those whose father was working in a skilled trade than others (27% compared to 19%);
- those with above average trade-related vocational interests (28% compared to 13%); and
- those in the lowest three-quarters of family socioeconomic status compared to the highest quarter (23% compared to 14%).

There was a higher percentage of males in the population of New Apprentices than among those who were not New Apprentices. This overall difference in participation between males and females arose from an overwhelming majority of males among apprentices and a smaller majority of females among trainees. Apprentices, but not trainees, were more likely to have a father who was a tradesman or who had a technical education background, as shown in Figure 1.

Trainees were more likely to have a father who did not complete secondary school. Young people undertaking a traineeship or apprenticeship had different background characteristics from each other and from the cohort as whole. A corresponding analysis from a sample of young people who were in Year 9 in 1998 provided similar results, thus confirming the pattern from the sample that is the focus of this report.



**Figure 1 Percentage distribution of father's employment category for different groups of respondents**

## Educational Background

As shown in Table 2, there were differences in educational background between New Apprentices and other young people, and between apprentices and trainees. New Apprentices were more likely to come from a government school and less likely to have attended non-government school than the remainder of the cohort. The average reading and mathematics scores achieved in Year 9 by New Apprentices were below the average scores of the remainder of the cohort. This is reflected in the distribution across the achievement categories shown in Table 2. Participation in New Apprenticeships was higher among those who left school before Year 12 compared to those who had continued to Year 12.

**Table 2 Selected educational background characteristics of New Apprentices from the 1995 Year 9 LSAY cohort**

	New Apprentices			Other	Total cohort
	Apprentice	Trainee	All		
	%	%	%	%	%
<b>School sector</b>					
Government	77	77	77	66	68
Catholic	16	15	16	21	20
Independent	6	8	7	13	12
<b>Year 9 achievement (reading)</b>					
Highest (>1 sd above mean)	5	8	6	13	11
High (> mean)	31	39	35	42	41
Low (< mean)	25	25	25	24	24
Lowest (>1 sd below mean)	39	27	34	21	24
<b>Year 9 achievement (maths)</b>					
Highest (>1 sd above mean)	8	7	8	15	14
High (> mean)	22	23	22	26	25
Low (< mean)	44	44	44	37	39
Lowest (>1 sd below mean)	26	26	26	22	23
<b>Year 12 completion</b>					
Yes	51	73	61	86	81
No	49	27	39	14	19
<i>Number</i>	<i>790</i>	<i>640</i>	<i>1430</i>	<i>5547</i>	<i>6876</i>

Notes: Those participants who had undertaken both an apprenticeship and a traineeship have, for the purposes of this table, been classified as apprentices. Because of rounding columns may not add to 100%.

Taking the complementary perspective of the percentages from different groups who participated in New Apprenticeships, it can be noted that 41 per cent of early school leavers, compared to 16 per cent of school completers, were New Apprentices. However, the fact that a much higher proportion of the cohort continued to Year 12 than left before Year 12 results in Year 12 completers making up 61 per cent of all New Apprentices. The patterns observed with respect to school completion for the cohort from Year 9 in 1995 were replicated in an analysis of those who were in Year 9 in 1998. In that cohort, 23 per cent of those from government schools were New Apprentices compared to 14 per cent from non-government schools.

Other LSAY reports (Fullarton, 2001) have highlighted the importance of Vocational Education and Training (VET) in Schools programs in retaining students at school and providing pathways between education and employment. Table 3 indicates that those students who entered New Apprenticeships were more likely than those who did not enter a New Apprenticeship to have undertaken VET studies in Year 11 or 12. In fact, 35 per cent of those who completed Year 12 and had entered a New Apprenticeship had undertaken one or more VET in Schools subjects. Expressed differently, 25 per cent of all those who studied a VET subject in school and who completed Year 12 entered a New Apprenticeship, compared to 13 per cent of those who had not studied a VET subject. The influence of studying a VET subject in school was a little stronger for traditional apprentices than for trainees. Approximately 37 per cent of all traditional apprentices who had continued at school to Year 12 had included a VET subject in their Year 12 course.

VET subjects were more likely to be studied by students in government schools than in Catholic schools and twice as likely as those in independent schools. There was substantial variation among States and Territories in the percentage of students undertaking VET subjects in school (from 11 to 35 per cent). Furthermore, among schools the percentage of students undertaking a VET subject varied from 0 to 76 per cent of students in the school.<sup>3</sup>

**Table 3 Percentages of students from Year 9 in 1995 who had completed Year 12, by VET subjects at school and New Apprenticeship status**

	New Apprentices					
	Apprentice		Trainee		All New Apprentices	
	Yes	No	Yes	No	Yes	No
VET subject	37	21	32	21	35	20
No VET Subject	63	79	68	79	65	80
Total	100	100	100	100	100	100

### Vocational Interests

Peoples' interests can be viewed at several levels in relation to vocational and educational choice. At the most fine-grained level, situational interest can be seen as a response to an event or topic. At a second level, interest can be viewed as a relatively enduring predisposition of the person towards a specific class of objects or events such as a particular school subject (e.g. chemistry) or group of subjects (e.g. sciences) or an occupation (carpenter, builder). At a third level, interest is viewed as a general predisposition of individuals to prefer engagement with a broad group of similar activities. This perspective on interest has influenced vocational psychology and its broad interest themes involved are important in explaining educational and occupational preferences and choices. The perspective has been an important influence on careers advice and counselling. One of the best known theories of vocational interest was developed by Holland (1985) and it views vocational interests in terms of six main dimensions. The vocational interests of an individual are represented by a combination of the six dimensions.

<sup>3</sup> In the corresponding analysis of the younger cohort who had been in Year 9 in 1998, there was an increase in the extent of VET in Schools but the pattern was the same as for the cohort from Year 9 in 1995.

- Realistic interests predispose people to prefer such activities as building or repairing things and making objects. People with realistic interests like environments which ‘foster technical competencies’ where they are ‘encouraged to see themselves as having mechanical ability’ and which typically involve using ‘machines and tools’.
- Investigative interests predispose people to prefer such activities as experimenting, analysing and inquiring. People with investigative interests like environments which ‘encourage scientific competence’ where they are ‘encouraged to see themselves as scholarly’, as having ‘mathematical and scientific ability’.
- Artistic interests predispose people to prefer such activities as painting, dancing and playing music. People with artistic interests like environments which ‘foster artistic competencies’ where they are ‘encouraged to be expressive, original, intuitive, feminine, nonconforming [and] independent’.
- Social interests predispose people to prefer such activities as helping others and teaching. People with social interests like environments that emphasise ‘social competencies’ where they are ‘encouraged to see themselves as liking to help others’.
- Enterprising interests predispose people to prefer such activities as organising and selling. People with enterprising interests like environments which ‘encourage’ them to ‘see the world in terms of power, status, responsibility’, where they are rewarded with money, power and status.
- Conventional interests predispose people to prefer such activities as record keeping. People with conventional interests like environments which stimulate them to ‘engage in recording and organising data or records’, where they are encouraged to see themselves as having ‘clerical competencies’.

For this analysis vocational interests were represented by a set of six variables based on data gathered from students in the 1995 Year 9 LSAY cohort when they were in Year 10. Respondents indicated how they felt about a range of 18 different activities. For each activity they indicated whether it was an activity which they ‘like very much’, ‘like somewhat’, ‘dislike somewhat’ or ‘dislike very much’. The activities were chosen to represent the six major interest fields elaborated in Holland's (1985) theory of vocational choice. Scores for each interest domain were obtained by combining the responses to the three items.

As shown in Table 4, the interests recorded in Year 10 vary by form of training. Consistent with their occupational choice of trades, apprentices had higher realistic interests than trainees and the cohort as a whole, and lower conventional, artistic and social interests. In contrast, trainees had higher artistic and social interest scores and lower realistic interest scores than apprentices. The artistic interests of trainees were just a little lower than those of the rest of the cohort, but on the other dimensions trainees did not differ from the rest of the cohort.

**Table 4 Vocational Interest scale scores for New Apprentices in the 1995 Year 9 LSAY cohort**

	New Apprentices							
	Apprentices		Trainees		Other		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Realistic Interest	3.41	0.68	2.75	0.82	2.70	0.84	2.78	0.85
Conventional Interest	2.19	0.78	2.56	0.78	2.62	0.79	2.57	0.80
Investigative Interest	2.24	0.68	2.48	0.73	2.52	0.70	2.49	0.71
Enterprising Interest	2.52	0.63	2.71	0.63	2.74	0.62	2.72	0.63
Artistic Interests	2.67	0.64	2.70	0.65	2.81	0.67	2.78	0.67
Social Interests	2.86	0.63	3.24	0.62	3.19	0.61	3.16	0.62
Number of respondents	613		525		4598		5735	

Notes: Scale scores have a possible range from 1 (low interest) to 4 (high interest) and are based on the average of three items in each scale. SD refers to standard deviation and indicates the spread of scores containing two-thirds of the cases. The number of respondents differs slightly for each scale, so the average number of respondents has been shown.

### Field of Training

A classification of field of training was constructed from respondents' indications of the field in which they were studying and supplemented by information about the field in which they were working. New Apprentices were classified into 12 different fields of training: electronics, engineering, automotive, construction (separated into building, plumbing and other), food and hospitality, agriculture, services (separated into hairdressing, clerical and sales, and other – including community and health) and other.<sup>4</sup> Table 5 displays the distribution of New Apprenticeships across fields of training. Figure 2 illustrates the distribution in graphical form.

It is important to note that the distribution of fields of training shown in Table 5 and Figure 2 refers to school leavers from a cohort of young people for whom entering a New Apprenticeship is one among several possibilities. It will not necessarily be identical to other compilations that include entrants of various ages. Table 5 shows that approximately one third of all New Apprentices were employed in the services sector (and within services predominantly in clerical and sales). The next most populous fields were construction, food and hospitality, and automotive and other engineering.<sup>5</sup>

Apprentices and trainees participated in different fields of training, reflecting the different types of occupations and their differing training requirements. Apprentices dominated the fields of construction, automotive, engineering and electrical/electronics. These four broad fields involved 69 per cent of apprentices. For trainees the dominant field was services, which included 60 per cent all trainees. Food and hospitality had a similar number of apprentices and trainees, reflecting the diversity of training and employment options in that field.

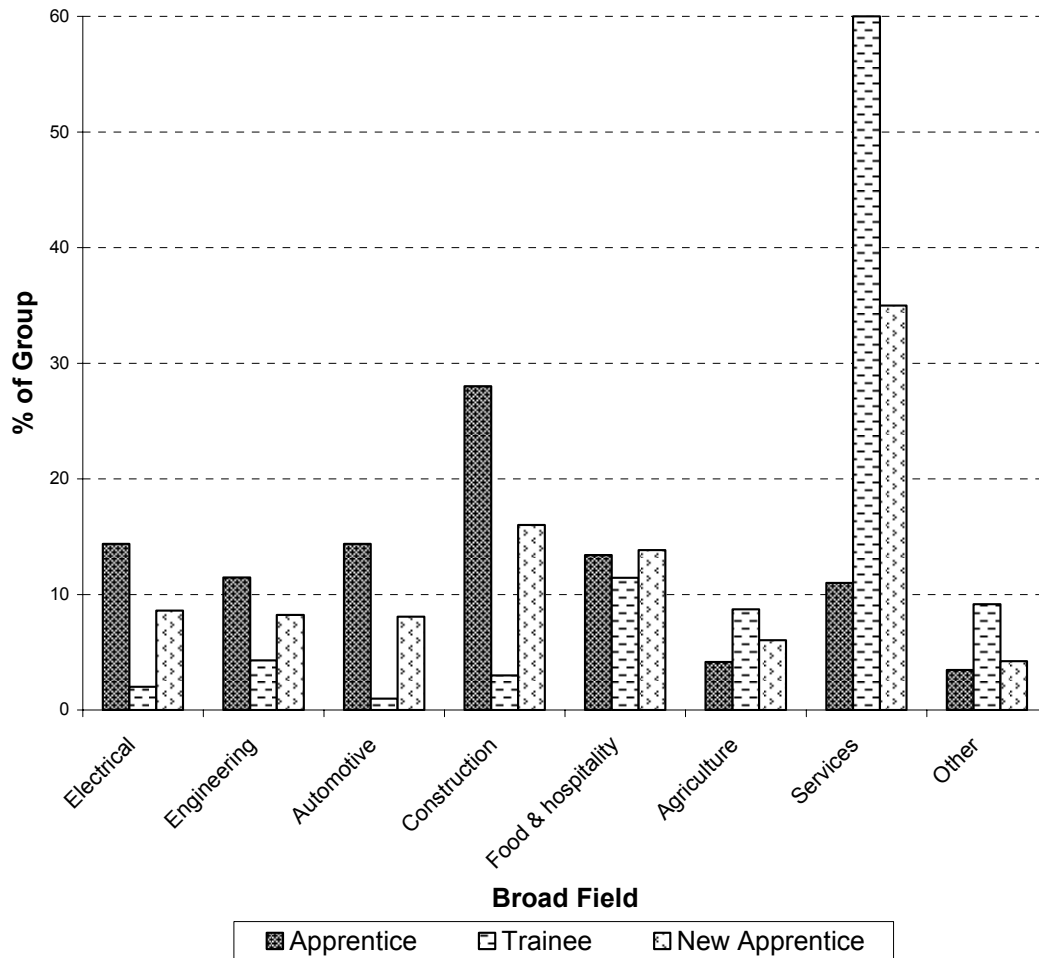
<sup>4</sup> The broad groups in this classification correspond to those used by NCVER, but different fields within construction and within services are shown separately.

<sup>5</sup> The distribution across fields was replicated in an analysis of the cohort from Year 9 in 1998.

**Table 5 Distribution of New Apprentices by field of training for 1995 Year 9 LSAY cohort**

Field of training	New Apprentices					
	Apprentices		Trainees		All	
	N	%	N	%	N	%
Electrical & electronics	104	14.4	14	2.0	118	8.6
Mechanical & fabrication engineering	83	11.5	30	4.3	113	8.2
Automotive	104	14.4	7	1.0	111	8.1
Construction: building & carpentry	83	11.5	0	0.0	83	6.0
Construction: plumbing	37	5.1	0	0.0	37	2.7
Construction: other	85	11.7	19	2.7	104	7.6
Food & hospitality	97	13.4	80	11.4	190	13.8
Agriculture & horticulture	30	4.1	61	8.7	83	6.0
Services: hairdressing	66	9.1	2	0.3	70	5.1
Services: clerical & sales	6	0.8	265	37.9	351	25.6
Services: other	4	0.6	157	22.5	55	4.0
Other	25	3.5	64	9.2	58	4.2
<b>Total</b>	<b>724</b>	<b>100.0</b>	<b>699</b>	<b>100.0</b>	<b>1373</b>	<b>100.0</b>

Notes: Respondents for whom the field of training was missing have not been included in the table. Classification of field of training is based on NCVER broad categories, with subdivision of construction and service areas according to ANZSIC (ABS, 1993).



**Figure 2 Percentage distribution of New Apprentices by field of training**

## Summary

The analysis of data from the 1995 Year 9 LSAY cohort indicated a number of characteristics associated with participation in a New Apprenticeship. Participation in New Apprenticeships was lower among those from homes where the parents held professional or managerial occupations, among those of a language background other than English and among those from metropolitan locations. New Apprentices had lower than average levels of performance in reading comprehension and mathematics, were less likely to have completed Year 12 than others in the cohort and were more likely to come from government rather than non-government schools.

The fields of training in which school leavers entered New Apprenticeships were services, construction, automotive, engineering, and food and hospitality. Apprentices and trainees participated in different fields of training, with apprentices being mostly in building, automotive, engineering and electrical fields of training and trainees being overwhelmingly in services. Apprentices, but not trainees, tended to come from families where the father was a tradesperson or held trades qualifications, and had 'realistic' vocational interests that were oriented to trades occupations.

## 4

## INFLUENCES ON PARTICIPATION IN NEW APPRENTICESHIPS: MULTIVARIATE ANALYSES

The previous chapter examined the associations between potential influences and participation in New Apprenticeships. Some of those observed associations could have been due to other influences that were correlated with the issues being investigated. In this chapter, multivariate techniques are used to identify the influence of various factors on participation in apprenticeship and traineeship. The reason for using multivariate techniques is that there is no single determinant of participation in these forms of training. Instead, there is a range of inter-connected influences on participation. Multivariate analyses provide an assessment of the net effect of each factor considered by controlling for the effects of other factors included in the analysis. In other words they provide an ‘other things equal’ estimate of the effect of one factor if all the other influences were held constant. The techniques also provide an insight into the process through which factors influence participation by examining what happens to initial relationships when other variables are included in the analysis. Logistic regression was used because the outcome variable is dichotomous.<sup>6</sup> In addition, because the data were derived from a clustered sample, the logistic regression was conducted using two-level hierarchical linear modelling.<sup>7</sup>

### Participation in Apprenticeships

A multivariate analysis of influences on participation in apprenticeship was conducted by entering three blocks (or sets) of variables in sequence. The first block included the background characteristics of the individuals before they began school. The second block consisted of acquired characteristics, such as achievement in literacy or numeracy and vocational interests, or the type of course undertaken at school. The third block consisted of characteristics of the school that an individual attended. Of course, at the third and final stage of the process, the result is the same as if all variables had been analysed simultaneously. However, the block-wise process provides additional information. Firstly, the results at each stage indicate how much the model is improved by including additional blocks of variables.<sup>8</sup> For example, it can be inferred whether acquired characteristics and school experiences improve the model over that which included student background alone. Secondly, it is possible to examine changes in the regression coefficients as additional blocks are added and thus infer the extent to which the observed effects are direct or transmitted.

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<sup>6</sup> For additional information on logistic regression see Tabachnik and Fidell (1996, pp. 575-634) and Menard (2002).

<sup>7</sup> For a description of hierarchical linear modelling see Bryk and Raudenbush (1992) and Raudenbush, Bryk, Cheong, Congdon and du Toit (2004).

<sup>8</sup> In logistic regression it is not possible to compute in a straightforward manner the percentage of variance explained at each step of the analysis because the dependent variable is dichotomous (Menard 2002, pp. 17-41). For that reason, the results include an estimate of the variance explained for each stage of the regression as well as other indicators of fit. The estimate is based on an ordinary HLM analysis using a dichotomous outcome variable.

### *Groups of influences*

The investigation considered these influences in three blocks or sets.

- The first block included individual background influences such as family socioeconomic status (as measured on the ANU3 scale), language spoken at home, home location while the person was at school, sex and whether the person's father was a tradesman or had trade qualifications.
- The second block included three variables: achievement in literacy and numeracy in Year 9, vocational interests, and the individual's school curriculum experience. Achievement in literacy and numeracy was based on tests administered in Year 9.<sup>9</sup> Vocational interest was a composite variable made up of the combination of vocational interest scores most strongly associated with participation in an apprenticeship, mainly the level of interest in realistic activities. Curriculum experience reflected the experience of schooling of the individual and was represented as a set of two dummy variables. The first reflected whether the student had completed Year 12 with VET in Schools subjects in either Year 11 or 12, and the second reflected whether the student had completed Year 12 without having studied any VET subjects in school. The reference category was having left school before Year 12.
- The third block of variables included characteristics of the school attended. It included an indication of whether the school attended was a government, Catholic or independent school (represented as a set of two dummy variables). It also included variables characterising other features of the school attended: the average socioeconomic level of the school, the percentage of students completing Year 12, the percentage of students studying a VET in Schools subject, the average score on an attitudes to school scale and the percentage of Year 12 enrolments in technology studies.

### *Results*

The first part of the analysis involved an examination of the percentage of the overall variance in apprenticeship participation that was due to variation between individuals and the percentage that was due to variation between schools. In fact only 3.5 per cent of the total variance was attributable to differences between schools.<sup>10</sup> Thus, overwhelmingly the variance in participation in apprenticeship was associated with individuals.

More detailed results of the analysis for apprenticeship participation are recorded in Table 6. Those results refer to three models. The first includes only background characteristics, the second refers to background characteristics plus acquired characteristics and the type of school program, and the third includes background characteristics plus acquired characteristics and the school program undertaken and school characteristics. For each of the three models the estimated variance explained is shown.

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<sup>9</sup> The Rasch-based scores for literacy and numeracy were highly reliable and the correlation coefficient between them was 0.54.

<sup>10</sup> The extent of variation can also be seen in the descriptive statistics for the distribution of apprentices. In 20 per cent of the schools no students became apprentices, and in just over 20 per cent of schools 3 or more students became apprentices. For the majority of schools (60%), 1 or 2 students entered an apprenticeship.

**Table 6 Results of logistic regression analyses for participation in apprenticeship among 1995 Year 9 LSAY cohort members**

Independent variable	Model 1			Model 2			Model 3		
	B	S.E.	Exp(B)	B	S.E.	Exp(B)	B	S.E.	Exp(B)
Socioeconomic status	<b>-0.19</b>	<b>0.05</b>	<b>0.83</b>	-0.02	0.06	0.98	0.06	0.07	1.06
<b>Sex (male cf female)</b>	<b>2.18</b>	<b>0.12</b>	<b>8.87</b>	<b>1.27</b>	<b>0.17</b>	<b>3.55</b>	<b>1.19</b>	<b>0.17</b>	<b>3.29</b>
<b>Home language (other cf English)</b>	<b>-1.40</b>	<b>0.26</b>	<b>0.25</b>	<b>-1.33</b>	<b>0.32</b>	<b>0.26</b>	<b>-1.43</b>	<b>0.32</b>	<b>0.24</b>
Location									
Provincial (cf metropolitan)	<b>0.25</b>	<b>0.10</b>	<b>1.29</b>	0.18	0.12	1.20	0.13	0.12	1.14
Rural or remote (cf metropolitan)	<b>0.69</b>	<b>0.17</b>	<b>2.00</b>	0.42	0.25	1.52	0.36	0.22	1.43
<b>Father in skilled trades</b>	<b>0.64</b>	<b>0.11</b>	<b>1.90</b>	<b>0.48</b>	<b>0.14</b>	<b>1.61</b>	<b>0.46</b>	<b>0.14</b>	<b>1.58</b>
Father trade qualification	0.08	0.11	1.08	0.18	0.14	1.19	0.18	0.14	1.19
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<b>Reading achievement</b>				<b>-0.22</b>	<b>0.07</b>	<b>0.80</b>	<b>-0.21</b>	<b>0.07</b>	<b>0.81</b>
Mathematics achievement				-0.09	0.07	0.92	-0.05	0.07	0.95
<b>Trade related vocational interests</b>				<b>0.75</b>	<b>0.08</b>	<b>2.11</b>	<b>0.76</b>	<b>0.08</b>	<b>2.14</b>
Type of school course									
<b>Year 12 with VETIS (cf no Yr 12)</b>				<b>-0.82</b>	<b>0.16</b>	<b>0.44</b>	<b>-0.82</b>	<b>0.17</b>	<b>0.44</b>
<b>Year 12 no VETIS (cf no Yr 12)</b>				<b>-1.33</b>	<b>0.16</b>	<b>0.26</b>	<b>-1.33</b>	<b>0.16</b>	<b>0.26</b>
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School sector									
Catholic school (cf govt.)							0.15	0.14	1.16
Independent school (cf govt.)							0.02	0.19	1.02
<b>School mean SES</b>							<b>-0.27</b>	<b>0.10</b>	<b>0.76</b>
School mean % VETIS							-0.93	0.49	0.39
School mean % year 12							-0.11	0.55	0.89
School mean attitudes to education							0.04	0.07	0.96
<b>School % technology enrolments</b>							<b>1.86</b>	<b>0.46</b>	<b>6.41</b>
Constant	-6.07	0.24	0.00	-4.03	0.31	0.02	-3.92	0.32	0.02
Estimated % variance explained		<b>9.3</b>			<b>22.7</b>			<b>25.7</b>	

Note: Statistics shown are:

B the unstandardised regression coefficient

S.E. the standard error of the regression coefficient

Exp (B) the odds ratio that indicates the magnitude of the effect.

Figures in bold indicate the regression coefficient is statistically significant at the five per cent level.

For each of the models, the data show the regression coefficient, its standard error, and the exponent of the regression coefficient. Where the effect is statistically significant at the .05 level the coefficient and its associated statistics are shown in bold. A positive coefficient means that the factor increases the chances of being an apprentice. The exponent of the regression coefficient indicates the odds ratio for influence of the factor on participation in apprenticeship. For example (in Model 1) those who had a father who was a tradesman had almost twice the chance of participating in an apprenticeship (compared to not participating in an apprenticeship) than those who did not have a father who was a tradesman, other things equal.

The results for Model 1 indicate a strong effect of sex (males are almost nine times as likely to be apprentices as females) and of being of an English-speaking background (those of an English-speaking background were four times as likely to be an apprentice as those who did not speak English at home). Those students whose father was a tradesperson were almost twice as likely to be an apprentice as other students. There is also an effect on apprenticeship participation of family socioeconomic status, with an increase of one

standard deviation on this variable being associated with a drop of 20 per cent in the chances of being an apprentice. Students from rural and remote locations were twice as likely to be apprentices as their peers from metropolitan locations; there was a smaller effect for those from provincial locations. The approximation of the variance explained indicates that just over 9 per cent of the variance in apprenticeship participation is explained by these individual background characteristics.

Including acquired characteristics and the experience of senior secondary schooling, as reported in Model 2, increases the estimated variance explained to almost 23 per cent. There is an association between earlier school achievement and apprenticeship participation. For reading achievement, but not mathematics achievement, there is a negative association with participation in an apprenticeship. A difference of one standard deviation in reading achievement is associated with a 20 per cent lower chance of being an apprentice. Vocational interests are also important as an influence on apprenticeship participation. Those whose trade-related interests score is one standard deviation higher than their peers' are twice as likely to be an apprentice, other things equal. A second observation from the results of the analysis of Model 2 is that the effects of family socioeconomic status become smaller and non-significant. This is because family socioeconomic status is associated with taking Year 12 without VET in Schools, which is more strongly but negatively associated with apprenticeship participation than is socioeconomic status. For similar reasons, the influence of location becomes non-significant when the type of senior school program is included.

Model 3 includes school characteristics as well as background characteristics, acquired characteristics and the senior school program experienced. Including the set of school characteristics adds only 3 per cent to the variance explained. This increment is relatively small because there is little between-school variance to explain. In fact, the school characteristics in the model account for a substantial percentage (approximately 80%) of the variance between schools that does exist. Of the school characteristics that account for the differences among schools, the most influential is the percentage of senior school enrolments in technology subjects. Other things equal, a student at a school with a 13 percentage point higher level of enrolments in technology subjects is six times as likely to participate in an apprenticeship. The results for the analysis of Model 3 also show that schools serving populations of lower average socioeconomic status have higher levels of apprenticeship participation.<sup>11</sup>

### *Interpretation*

The significant individual background influences on apprenticeship participation are sex, home language and having a father as a tradesman. After allowing for the effects of all other factors in the full model, males are more than three times as likely as females to be apprentices, those of an English speaking background are four times as likely as other students to be apprentices, and those whose father is a tradesman are nearly 60 per cent more likely than other young people to be an apprentice. It can be noted that the difference

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<sup>11</sup> It should be noted that if the analysis is conducted without including average socioeconomic status, an effect for school sector is observed. However, the effect is weaker than that of average socioeconomic status and is not significant in the analysis of the full model shown in Table 6. A possible interpretation is that government schools serving populations of high socioeconomic status do not have many of their graduates entering apprenticeships. Similarly the percentage of enrolments in VET in Schools subjects has a weaker influence on apprenticeship participation than the percentage of enrolments in technology subjects and therefore is not significant in the analysis of model 3 as reported in Table 6.

between males and females in apprenticeship participation is reduced when the vocational interest measure is included in the analysis. In other words, differing interests explain a large part but not all of the differences between males and females in apprenticeship participation. When girls have similar interests to boys, they are still less likely to enter into an apprenticeship. In a similar way, the results show that the influence of having a father who is a tradesman is reduced when differences in vocational interests are included in the analysis. In other words part but not all of the influence of having a father who is a tradesman arises from differences in vocational interests.

Acquired characteristics also influence apprenticeship participation. Apprenticeship participation is associated with stronger trade-related vocational interests (a one standard deviation increase in trade related interests is associated with a person being more than twice as likely to be an apprentice) and lower levels of reading achievement (a one standard deviation lower score in reading is associated with a person being 25 per cent more likely to be an apprentice). There is an influence of the type of senior school program undertaken on apprenticeship uptake. Participation in apprenticeship is more likely among those who leave school before reaching Year 12 than among those who continue to Year 12. Furthermore, participation in an apprenticeship is more likely among those who include one or more VET in Schools subjects in their program than among those who do not.

Among the school characteristics that influence apprenticeship participation, the largest effect is of the percentage of Year 12 enrolments in technology subjects. This indicator represents a general orientation of the senior school curriculum. That this effect is evident, after making allowance for a range of individual and other school influences, suggests that the type of curriculum does influence the uptake of apprenticeships. There is also an effect of average socioeconomic status for the school: students who enter an apprenticeship are more likely to have attended a school with a lower average socioeconomic status than those who chose not to enter an apprenticeship.

### **Participation in Traineeships**

As reported for the analysis of apprenticeships, a multivariate analysis of participation in traineeships provides information about the influence of various factors on participation in traineeship. These analyses provide an indication of the net effect of each factor considered by controlling for the effects of other factors included in the analysis. Logistic regression is used because the outcome variable is dichotomous and, because the data are derived from a clustered sample, the logistic regression is conducted using two-level hierarchical linear modelling.

#### *Analysis*

In the analysis of participation in traineeships the block-wise procedure is not used because the percentage of variance explained was so small and no additional information was obtained from a block-wise procedure. Rather, all potential predictors are entered in one step but at two levels: individual level and school level.

#### *Results*

Only 3.5 per cent of the total variance was attributable to differences between schools in participation in traineeships. In other words, the variance in participation in traineeships is

overwhelmingly associated with differences among individuals and not with differences among the schools they attend.<sup>12</sup>

Results are shown in Table 7. The individual factors that had a statistically significant influence on participation in traineeships were sex (females were nearly 40% more likely than males to participate in a traineeship), language background (those of an English-speaking background were 60% more likely to be trainees as those of a non-English speaking background to participate in a traineeship), reading achievement (trainees had lower reading achievement levels in Year 9 than non-trainees) and investigative interests (trainees had lower levels of investigative interests). Young people from provincial locations were more likely to participate in traineeships than young people from metropolitan locations, other things equal. The variables in the analysis accounted for just less than 6 per cent of the variance among individuals in traineeship participation.

Trainees tend to come from schools of lower average socioeconomic level and this explains a little more than half of the variance between schools. Overall, the model does not account for much of the variation in participation in traineeships.

**Table 7 Results of logistic regression analyses for participation in traineeship in the 1995 Year 9 LSAY cohort**

Independent variable	B	S.E.	Exp(B)
<b>Individual Level</b>			
Father in skilled trades	-0.03	0.11	0.97
<b>Sex (female cf male)</b>	<b>0.32</b>	<b>0.10</b>	<b>1.38</b>
<b>Reading achievement</b>	<b>-0.15</b>	<b>0.05</b>	<b>0.86</b>
Mathematics achievement	-0.05	0.06	0.95
<b>Home language (other cf English)</b>	<b>-0.49</b>	<b>0.23</b>	<b>0.61</b>
Socioeconomic status	-0.00	0.05	1.00
<b>Investigative interests</b>	<b>-0.18</b>	<b>0.07</b>	<b>0.83</b>
Year 12 VET in schools (cf not Yr 12)	-0.11	0.15	0.89
<b>Year 12 not VET in schools (cf not Yr 12)</b>	<b>-0.55</b>	<b>0.14</b>	<b>0.58</b>
<b>Provincial location (cf. metropolitan)</b>	<b>0.36</b>	<b>0.12</b>	<b>1.44</b>
Rural or remote location (cf. metropolitan)	0.29	0.23	1.33
<b>School Level</b>			
Catholic school (cf. government)	-0.11	0.17	0.90
Independent school (cf. government)	-0.30	0.17	0.74
<b>School mean SES</b>	<b>-0.19</b>	<b>0.09</b>	<b>0.83</b>
School % VETIS	-0.05	0.36	0.94
School % year 12	-0.67	0.55	0.51
School mean attitudes to schooling	0.09	0.07	1.10
Constant	-2.51	0.20	0.08
<b>Estimated % variance explained</b>		<b>7.5</b>	

Notes: Statistics shown are:

B the unstandardised regression coefficient

S.E. the standard error of the regression coefficient

Exp (B) the odds ratio that indicates the magnitude of the effect.

Figures in bold indicate the regression coefficient is statistically significant at the five per cent level.

<sup>12</sup> From 21 per cent of schools no students participated in a traineeship, and from only 22 per cent of schools did three or more students enter a traineeship. For the majority of schools (57%), 1 or 2 students participated in a traineeship.

### *Interpretation*

The conclusion from this analysis is that the factors included in the models did not have a large impact on students' decisions to enter into traineeships. It also indicated that the personal and educational characteristics of trainees were similar to those of the whole cohort.

### **Summary**

The analyses of these longitudinal data indicate a number of factors that are associated with participation in a New Apprenticeship. Participation in a traditional apprenticeship is associated with males from English-speaking backgrounds whose fathers work in skilled trades. It is also associated with lower than average achievement in reading and with stronger than average trade-related vocational interests. Some aspects of secondary school experience influence participation in a traditional apprenticeship. Participation is highest among those who left school before Year 12. In addition, for those who complete Year 12, participation in apprenticeship is higher among those whose senior school studies include at least one VET in Schools subject. Those who attend a school with a strong level of enrolments in technology subjects (and VET subjects) in the senior secondary years have an increased likelihood of participation in an apprenticeship. Participation in traineeships is more broadly spread across the full cohort but with a tendency to involve more females than males, people of slightly lower than average reading achievement and people from English-speaking backgrounds. Trainees also tend to come from schools of lower average socioeconomic level and from schools in non-metropolitan locations.

## 5

**PROGRESS THROUGH NEW APPRENTICESHIPS**

This section of the report is concerned with the pathways of young people into and through New Apprenticeships. It focuses on the cohort of young people who were in Year 9 in 1995. The members of the cohort who continued at school would have been in Year 12 in 1998 and, for them, a four-year apprenticeship direct from school would have been completed at the end of 2002. For that reason the survey data from 2003 have been used to provide an indication of progress and completion. Even so, those who did not commence a New Apprenticeship direct from school might still be in progress at the time of the 2003 data collection.

The chapter begins with a consideration of commencement in a New Apprenticeship, including whether entrants had completed Year 12 or not, whether they entered their training direct from school or after a period doing something else, and whether they had undertaken just one course of training or several. The chapter then examines progress through New Apprenticeships in terms of completion, continuation or discontinuation.<sup>13</sup> It examines the reasons given for discontinuation and presents an analysis of the factors associated with non-completion.

**Commencing a New Apprenticeship***School completion*

As noted in the previous section, approximately one-half of all apprentices and nearly three-quarters (72%) of trainees had completed Year 12 prior to their course of training. As indicated by the data in Table 8, there was some variation in Year 12 status across fields of training for commencing apprentices.

**Table 8 Percentage of commencing New Apprentices from the 1995 Year 9 LSAY cohort who completed Year 12, by field of training**

<b>Field of training</b>	<b>Apprentices</b>	<b>Trainees</b>
Electrical & electronics	75	--
Engineering & related fields	51	--
Construction (various fields)	41	--
Food & hospitality	40	70
Services: hairdressing	46	--
Agriculture & horticulture	55	59
Services: sales & clerical	--	76
Services: health & community	--	76
<b>Total</b>	<b>51</b>	<b>72</b>

More than 70 per cent of apprentices in electrical (and electronics) fields had completed Year 12 (in the 1995 Year 9 LSAY cohort, three-quarters of apprentices had completed Year 12). In contrast, fewer than one-half of the commencing apprentices in the food trades

<sup>13</sup> The term 'discontinuation' has been used to include those who withdrew and those whose apprenticeship was cancelled. Sometimes the term 'non-completion' is used.

and hairdressing had completed Year 12. Among trainees there was less variation in the percentage of entrants with Year 12 completion across fields.

### *From school to training*

Table 9 shows that more than two-thirds (68%) of school non-completers proceeded from school to apprenticeships in the same or next year after leaving school. The same or next year can be considered a direct transition representing, for example, finishing school in 1998 and starting training in 1998 or finishing school in 1998 and commencing training in 1999 (possibly at the beginning of 1999). Amongst those who completed Year 12 the corresponding percentage was 86 per cent. In total, over three-quarters of respondents had little or no gap between school and training.

**Table 9 Transition from school to apprenticeship among the 1995 Year 9 LSAY cohort**

Years between school and apprenticeship	Year 12 non-completers		Year 12 completers		Total	
	N	%	N	%	N	%
0	127	46.9	184	63.4	311	55.4
1	56	20.7	66	22.8	122	21.7
2	47	17.3	27	9.3	74	13.2
3	17	6.3	4	1.4	21	3.7
4	7	2.6	0	0	7	1.2
5	2	0.7	0	0	2	0.4
Missing	15	5.5	9	3.1	24	4.3
Total	271	100.0	290	100.0	561	100.0

### *One Course or Several*

For many students, a New Apprenticeship was part of a mix of education or training courses taken after leaving school. Table 10 records the various combinations of qualifications obtained by New Apprentices in the 1995 Year 9 LSAY cohort.

Four-fifths of those who had been apprentices had participated in just one apprenticeship, with a further 2 per cent participating in two apprenticeships. Almost all of those who participated in two apprenticeships had those apprenticeships from the same field of training. Only two of the respondents indicated that they undertook a second apprenticeship in a different field.<sup>14</sup>

Approximately one in eight had participated in another course before commencing an apprenticeship. Many trainees (37%) had a more mixed experience of post secondary education, principally by combining a traineeship with another course either before or after (or both before and after). Fifty-six per cent of trainees had participated in just one traineeship and 7 per cent had participated in two.

<sup>14</sup> There was some evidence that respondents may have indicated a second apprenticeship when in fact what they had done was a pre-apprenticeship followed by an apprenticeship. It is not possible to detect the extent to which this occurred.

**Table 10 Combinations of post-secondary education and training courses for New Apprentices from the 1995 Year 9 LSAY cohort**

<b>Apprentices</b>	<b>N</b>	<b>%</b>	<b>Trainees</b>	<b>N</b>	<b>%</b>
One apprenticeship only	561	79.6	One traineeship only	368	56.4
Two apprenticeships	15	2.1	Two or more traineeships	42	6.5
Other course, apprenticeship	91	12.9	Other course, traineeship	108	16.5
Apprenticeship, other course	35	5.0	Traineeship, other course	113	17.3
Other combination	3	0.4	Mixed courses	22	3.4
<b>Total</b>	<b>705</b>	<b>100.0</b>	<b>Total</b>	<b>653</b>	<b>100.0</b>

### Progress through New Apprenticeships

Longitudinal data from LSAY provide an important perspective on progress through and completion of New Apprenticeships. Longitudinal data enable the tracking of individuals rather than events, so that those who discontinue one apprenticeship and resume another to eventually complete can be considered as completions rather than the change being recorded as a withdrawal. Those data also provide an opportunity to link individual progress with other individual characteristics of the young person. However, longitudinal data obtained by sample survey methods may not correspond with data from administrative statistical collections.

Survey methods depend on respondents to recognise what course of training they undertook and whether they completed that course. Accurate recognition of the course of training is possibly more of an issue for traineeships: courses may be described as traineeships that are not New Apprenticeships, and some short traineeships may not be recognised as such by a participant. Self-reporting of completion is even more problematic. Participants may complete a course to the satisfaction of themselves and even their employer, but either may not complete all the requirements or may not register for certification. For example, a trainee may consider that a course was completed, even though a final assignment was not submitted, so a completion would not have been recorded. This results in an overestimate of 'completion' rates on the basis of data from sample surveys and an underestimate of 'completions' based on administrative data, if completions are taken to be indicated by certification. It is likely that these issues of self-reporting are more an issue for traineeships than apprenticeships, because the latter have a more established formal structure.

Longitudinal survey methods depend on successfully tracking the progress of each individual through a course of training. Each year a number of LSAY participants do not continue in the survey, and the proportion who do not continue is drawn disproportionately from those who are lower achievers at school and who do not participate in postcompulsory education and training.<sup>15</sup> If those who discontinue a New Apprenticeship also have a greater preponderance to withdraw from the survey, the result will be an overestimate of completion rates, because more of those who complete also remain in the survey.

<sup>15</sup> This differential participation in the survey is partly compensated by weighting procedures.

*Progress and prior school attainment*

Table 11 records the overall progress of New Apprentices who were still in the survey to 2003 and according to whether or not they had completed Year 12 prior to beginning their course of training. Overall, 77 per cent had completed, 7 per cent were still in progress and 16 per cent had discontinued. Projections based on these percentages result in the inference that the overall projected completion rate could be approximately 83 per cent.<sup>16</sup> A comparison between Year 12 completers and Year 12 non-completers is complicated by the numbers of Year 12 completers who were still continuing their apprenticeship in 2003. On the basis of projections for those still ongoing, the completion rate for those who had continued school to Year 12 would be 85 per cent, and for those who left school before Year 12 the completion rate would be 79 per cent.

The differences between these rates and rates based on administrative data are quite large and arise mainly because of the discrepancy between survey-estimated and administrative completion rates for trainees (Ball & John, 2005). Differential attrition in longitudinal surveys may result in a greater proportion of those with less successful employment experiences dropping out of the survey with a consequent overestimate of completion rates. Correspondingly, administrative sources of data may underestimate completion rates due to difficulties in tracking individuals across time, which may result in counting individuals as non-completers when in fact they changed and then completed. However, if an allowance is made for differences in survey attrition between those who complete and those who do not, the estimated completion rate would be lower. Between 1998 and 2003 the number of active survey participants fell from 9733 to 5354. If those who discontinued a New Apprenticeship had been 25 per cent more likely to withdraw from the survey, the corrected completion rate would be estimated as likely to be a little less than 80 per cent.

**Table 11 Progress status of New Apprentices to 2003 by school completion for the 1995 Year 9 LSAY cohort**

Progress category in 2003	Year 12 completion status		
	Completed	Did not complete	Total
Ongoing	10.7	2.6	7.3
Finished	77.1	77.4	77.2
Discontinued	12.2	20.0	15.5
Total	100.0	100.0	100.0
<i>Number</i>	797	586	1383

Tables 12 and 13 provide information on completion of apprenticeships and traineeships separately. Table 12 shows that the majority of those from the 1995 Year 9 LSAY cohort who entered a traditional apprenticeship had completed their apprenticeship by 2003. Overall, one in six (17%) of apprentices had discontinued and one in ten (10%) were continuing with their apprenticeship. Almost three-quarters (74%) had completed their apprenticeship by 2003.

Among those who had left school before Year 12, nearly four-fifths (79%) had finished and just under one-fifth (19%) had discontinued. A very small percentage (2%) were still continuing, possibly because they did not commence directly from school. Among those who had attained Year 12 at school, a little more than two-thirds (68%) had completed

<sup>16</sup> Assuming those still continuing eventually complete in the same proportions as other New Apprentices.

their apprenticeship, a little more than one in eight had discontinued (13%), and just under one-fifth (19%) were continuing. On the basis of similar projections to those outlined previously, the projected completion rate for apprentices overall would be 81 per cent, and there would be almost no difference between those who had completed Year 12 and those who had not completed Year 12.

Applying a correction for differential attrition (that is, that non-completers were 25% more likely to withdraw from the survey) would result in an estimated completion rate for traditional apprentices of approximately 77 per cent. This figure is comparable with, and just a little greater than, completion rates based on administrative data.

**Table 12 Progress status of apprentices to 2003 by Year 12 completion status for the 1995 Year 9 LSAY cohort**

Progress category in 2003	Year 12 completion status		
	Completed	Did not complete	Total
Ongoing	18.9	2.4	9.9
Finished	67.8	78.5	73.7
Discontinued	13.4	19.1	16.5
Total	100.0	100.0	100.0
<i>Number</i>	<i>303</i>	<i>382</i>	<i>685</i>

Table 13 records corresponding data for traineeships. Given that traineeships were generally of shorter duration than apprenticeships, there was a different balance between the percentages finished and continuing. By 2003, more than four-fifths (81%) of trainees from the 1995 Year 9 LSAY cohort had completed, one-seventh (14%) had discontinued, and one in twenty (5%) were continuing. The projected completion rate overall was 85 per cent. By 2003, almost twice the percentage of non-completers (22%) as completers (12%) had discontinued their traineeship, and there was a difference in the projected completion rates of the two groups (88% for Year 12 completers and 78% for non-completers).

**Table 13 Progress status of trainees to 2003 by Year 12 completion status for the 1995 Year 9 LSAY cohort**

Progress category in 2003	Year 12 completion status		
	Completed	Did not complete	Total
Ongoing	5.7	3.0	4.8
Finished	82.8	75.4	80.7
Discontinued	11.5	21.6	14.5
Total	100.0	100.0	100.0
<i>Number</i>	<i>494</i>	<i>204</i>	<i>698</i>

In the case of traineeships, a correction for differential survey attrition results in an estimated completion rate of 82 per cent. This is still considerably greater than completion rates based on administrative data and is possibly the result of LSAY respondents recording as 'completed' courses that had not been formally recorded as having been completed.

*Progress and field of training*

To examine progress by field of study, the categories completed and ongoing were combined to represent successful progress. This was contrasted with those who had discontinued because they had withdrawn or had their New Apprenticeship cancelled. Overall, there is little difference in non-completion rates between apprentices and trainees. Successful progress appears to vary by field of training. Table 14 shows that, among apprentices, hairdressing and food and hospitality had the highest percentage of students not having finished or continuing with their course. Automotive and building had the lowest rates of non-continuance. Among trainees, the fields with the highest rates of non-continuance were in food and hospitality, and health and community services.

**Table 14 Progress status to 2003 of New Apprentices by form and field of training among the 1995 Year 9 LSAY cohort**

	Apprentices			Trainees		
	% of commencers			% of commencers		
	Finished/ ongoing	Not continuing	N	Finished/ ongoing	Not continuing	N
Electrical & electronics	84	16	111	--	--	--
Engineering & related fields	93	7	207	--	--	--
Construction (various fields)	91	8	239	--	--	--
Food & hospitality	76	24	110	78	22	79
Services: hairdressing	67	32	69	--	--	--
Agriculture & horticulture	83	16	30	95	6	53
Services: sales & clerical	--	--	--	91	9	341
Services: health & community	--	--	--	85	16	51
Total	85	15	784	86	14	647

Notes: A number of fields have been excluded because of small numbers. In addition, there were cases for which a field could not be assigned.

### Reasons for Discontinuing a New Apprenticeship

In the year of withdrawal from a New Apprenticeship, each person was asked to indicate the main reason for discontinuing. The key reasons that were reported are recorded in Table 15.

The most prevalent reasons given were health and personal reasons, followed by dislike of the type of work, getting along with supervisors or others at work, being offered a better job or feeling that the pay was too low. Thus the most frequently cited reasons for discontinuing appear to be personal, related to the workplace or related to rewards. The difficulty of the study, future job prospects or the nature of on- or off-the-job training were not key reasons for discontinuing a New Apprenticeship. On the basis of this pattern of reasons for not continuing with an apprenticeship, it appears unlikely that prior characteristics of the type measured in surveys would predict non-continuance.

Table 15 shows some differences between apprentices and trainees in the reasons given for discontinuing their training. Trainees were more disposed than apprentices to cite reasons such as being offered a better job or seeing job prospects in the industry as not being good. They also more frequently than apprentices cited health and personal reasons, not getting on with the boss and others, and not being happy with their training.

It is worth noting that relatively few New Apprentices indicated that not being happy with training (either on-the-job or off-the-job) was a reason for discontinuing for a larger number of trainees than apprentices.

**Table 15 Main reasons why individuals discontinue a New Apprenticeship as a percentage of total discontinuations**

Main reason	Percentage of respondents citing as main reason		
	Apprentices	Trainees	All
Health and personal reasons	18	27	22
Didn't like the type of work	23	18	21
Don't get on with boss or other people at work	15	21	18
Offered a better job	8	18	13
Pay too low	11	9	10
Job prospect in industry not good	3	8	5
You weren't happy with the off-the-job training	2	8	5
Problems with travelling or transport	2	3	2
You weren't happy with the on-the-job training	1	3	2
Study was too difficult	1	--	1
Other	16	12	14
Total	100	100	100
<i>Number of cases providing reasons</i>	<i>96</i>	<i>86</i>	<i>182</i>

### Destinations of Those Who Discontinue

In this section, attention is focussed on the educational and occupational destinations of those who discontinued a traditional apprenticeship. Information about the destinations of trainees is not clear and is difficult to interpret. Approximately one in six (16%) of those who discontinued an apprenticeship proceeded to another course of study. For one-half of these (8% overall) this was a certificate in VET or TAFE. Just a few (2% overall) studied for a TAFE diploma, and some (6% overall) transferred to study for a bachelor degree at a university.

Significantly more individuals who had discontinued an apprenticeship were not participating in the workforce compared to those who had completed their apprenticeship. While not all those who had completed their apprenticeship were still working in the industry in which they qualified or using the trade they learnt, they were still more likely to be employed than those who had discontinued their apprenticeship before completion.

The employment outcomes for those who discontinued an apprenticeship were less satisfactory than for those who had completed an apprenticeship. Ninety-five per cent of those who had completed an apprenticeship were employed in 2003 compared to 84 per cent of those who had discontinued their apprenticeship.

There was also some evidence that those who had completed an apprenticeship were able to manage their financial lives more satisfactorily than those who had discontinued. Twenty-three per cent of those who had discontinued indicated that it was 'fairly' or 'very' difficult to manage financially in a typical month compared to just 11 per cent of those who had completed an apprenticeship.

## Characteristics of Apprenticeship Discontinuations

Multivariate analysis was used to investigate the influence of various factors on non-completion of an apprenticeship or traineeship. The analysis focused on those who had been an apprentice at some stage up to 2003. The outcome was whether the apprentice had discontinued the New Apprenticeship or not. This form of analysis provides an indication of the net effect a range of potential influences had on discontinuation. Logistic regression was used because the outcome (or dependent) variable is dichotomous. For the analyses, all continuous independent variables were standardised, but all binary variables remained as categorical variables. Results of the analysis have been recorded in Table 16.

The multivariate analysis of influences on discontinuation was similar to that used in the analysis of participation in apprenticeship, but block-wise regression was not used because so little of the variation in discontinuation could be explained. In addition, the analysis of factors associated with discontinuing an apprenticeship included a consideration of the field of training (to determine whether there were differences between fields that were net of other associated influences). The analysis included:

- A group of individual background characteristics: father as a tradesman, father with a trade qualification, language spoken at home and sex.
- A set of acquired characteristics (Year 9 achievement in reading and mathematics, and trade-related interests) and school curriculum experiences. These were defined in the same way as for the analysis of influences on apprenticeship participation (Table 6).
- A set of variables characterising various features of the school attended: the school sector, the average socioeconomic level of the school, the percentage of students completing Year 12 and the percentage of students studying a VET in Schools subject.
- A set of dummy variables characterising the field of training, with hairdressing being the reference category.

The data show the regression coefficient, its standard error and the exponent of the regression coefficient.

The results in Table 16 show that almost none of these background factors has a statistically significant influence on discontinuation in any of the four models. Partly this is because the number of those in the sample who discontinue is small, and partly it is because the effects are small in magnitude. In an initial analysis, there appeared to be an effect for females to discontinue to a greater extent than males. However, when field of training<sup>17</sup> was included in the analysis the difference between males and females became non-significant. This can be interpreted as reflecting the fact that females undertake training in fields with relatively high rates of discontinuation.

There is a moderate effect size for language background, but it is not statistically significant because the number of apprentices with a language background other than English is so small.

The conclusion from these analyses is that the background characteristics of apprentices—including both home background and educational background—have little influence on their propensity to complete or discontinue an apprenticeship. Based on the self reports of reasons for discontinuing an apprenticeship, it would appear that non-completion of an

<sup>17</sup> Field of training was indicated by a set of dummy variables: electrical, engineering or automotive, building, and food and hospitality, with hairdressing as the reference category.

apprenticeship is more likely to be associated with changing or more clearly focussed interests, personal factors or aspects of the working environment. With the present data, it is not possible to build these into a model for analysis.

**Table 16 Results of analyses of discontinuation from New Apprenticeship including field of training among 1995 Year 9 LSAY cohort members**

Independent Variable	B	S.E	Exp(B)
Father in Skilled Trade	-.22	.32	.80
Father Trade Qualification	-.45	.39	.64
Sex (female cf male)	.69	.49	1.99
Reading Achievement	.00	.18	1.00
Mathematics Achievement	-.22	.18	.81
Home Language (other cf English)	.50	.90	1.65
Trade related interests	-.04	.24	.96
Socioeconomic status	-.17	.18	.85
Type of school course			
Year 12 without VET (cf no Year 12)	-.71	.48	.49
Year 12 with VET(cf no Year 12)	<b>-.73</b>	<b>.34</b>	<b>.48</b>
<b>School Variables</b>			
School Mean SES	-.11	.20	.90
School Mean % VET	-.28	.18	.79
School mean % year 12	.21	.17	1.23
<b>Field</b>			
Electrical (cf hairdressing)	.15	.58	1.16
Engineering (cf hairdressing)	-.69	.56	.50
Building (cf hairdressing)	-.53	.52	.59
Food and hospitality (cf hairdressing)	.79	.47	2.21
Constant	-2.60	1.27	.07
Estimated % variance explained		<b>7.0</b>	

Notes: (a) Dependent variable 1 = Discontinued New Apprenticeship, 0 = Completed or continuing.

(b) Statistics shown are:

B the unstandardised regression coefficient

S.E. the standard error of the regression coefficient

Exp (B) the odds ratio that indicates the magnitude of the effect.

(c) Figures in bold indicate the regression coefficient is statistically significant at the five per cent level.

## Summary

Most New Apprentices enter their course of training in the same year as or the next year after they complete school. Approximately one-half of those in apprenticeships and 70 per cent of those in traineeships have completed Year 12, but this percentage varies considerably across fields of training. Apprenticeships tend to act as a single pathway, but nearly one-half of those who have been in traineeships have participated in other post-school programs of education and training. For traditional apprenticeships, the rates of progress recorded in these longitudinal data are indicative of completion rates of approximately 77 per cent when allowance is made for differential attrition from the sample. Completion rates for traineeships are estimated to be approximately 82 per cent, but the issues associated with recording self-reported completions by trainees mean that this estimate should be treated with caution. Based on the statements of those who have discontinued an apprenticeship, the main reasons for not completing an apprenticeship appear to be associated with changing interests, personal factors or conditions at work.

## 6

## SUMMARY AND CONCLUSIONS

New Apprenticeships are important in terms of the pathways they provide from school education to working life and in terms of skill formation on which to base future occupational development. They involve a formal combination of work and study that provides for learning at work and in an educational institution. Participation patterns in New Apprenticeship differ from participation patterns in other programs of education and training, possibly because they require the participant to secure a job as well as a place in a course of study.

Just over one in every five (21%) members of the cohort that was in Year 9 in 1995 (and thus would have been in Year 12 in 1998) had participated in a New Apprenticeship by the end of 2003. Participation in a New Apprenticeship was higher among males than females (27% compared to 15%), those of an English-speaking background than other students (22% compared to 10%), and those from non-metropolitan than metropolitan backgrounds (26% compared to 18%). Participation was also higher among those in the lowest three-quarters of family socioeconomic status compared to the highest quarter (23% compared to 14%), which is an interesting non-linear effect.

Participation in New Apprenticeships was higher among those who left school before Year 12, compared to those who had continued to Year 12 (41% compared to 16%), those of below average reading and mathematics achievement than others (24% compared to 17%), and those who attended government rather than non-government schools (23% compared to 14%).

For traditional apprenticeships, there were some distinctive patterns that reflected the influence on participation of home environments, the development of interests, the curriculum they followed and the orientation of the school they attended. One aspect of the home environment that was influential was having a father who was a tradesman. Young people whose fathers worked in skilled trades were almost twice as likely as others to participate in a traditional apprenticeship. Similarly, the development of trade-related vocational interests influenced the uptake of a traditional apprenticeship, with a difference of one standard deviation in trade-related interests being associated with a doubling of the chances of participating in a traditional apprenticeship.

There were some aspects of an individual's school experience that influenced participation in a traditional apprenticeship. Firstly, participation was highest among those who left school before Year 12 (29% of early school leavers were apprentices compared to 6% of school completers).<sup>18</sup> Secondly, among those who had completed Year 12, participation in apprenticeships was higher among those whose senior school studies included at least one VET in Schools subject. Thirdly, among those who attended a school with a strong level of enrolments in technology subjects—and to a smaller extent VET subjects—in the senior secondary years, there was an increased likelihood of participation in an apprenticeship, other things equal.

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<sup>18</sup> Despite this difference, Year 12 completers constituted approximately one-half of all traditional apprentices because of the difference in the size of the populations of Year 12 completers and non-completers.

From these results several policy-related inferences can be drawn. The first inference is that a growth of numbers in New Apprenticeships in fields associated with traditional trades is likely to be from among those who proceed through school to Year 12. At present only a small percentage (6%) of those young people take up a traditional apprenticeship (even though approximately half (51%) of all traditional apprentices have completed Year 12). Analysis of data from 1980 to 1994 indicates that this percentage has not shifted greatly, being 7% in 1980, 3% in 1984, 5% in 1989 and 6% in 1994, although the percentage of apprentices with Year 12 increased from 14% in 1980 to 19% in 1989 and 41% in 1994 (Long et al, 1999, p. 8). In contrast, more than one quarter (29%) of those in the Y95 cohort who left school before Year 12 took up traditional apprenticeships. Thus there is greater scope for increasing apprentice numbers from Year 12 completers than early school leavers.

The second inference is that participation in a New Apprenticeship in trades fields will be facilitated by fostering, through experience and advice, interests in activities related to those fields. The evidence for this comes from the association between apprenticeship and both trade-related interests and having a father who is a tradesperson. Attention to the curriculum and experiences in the compulsory years of school might be an appropriate starting point to develop a stronger base for entry to apprenticeship, along with a consideration of the careers advice that young people receive.

The third inference is that what is available in the senior school curriculum is an important influence on participation in New Apprenticeships by those who stay at school to Year 12. This operates at two levels. The first level is that individuals who include VET subjects in their Year 12 course are more likely to enter a New Apprenticeship than those who do not. Moreover this influence is stronger for New Apprenticeships in trade fields than other fields. The second level is the school curriculum orientation, in that coming from a school with a strong level of enrolments in technology subjects in the senior secondary years is associated with an increased likelihood of participation in an apprenticeship.

On the basis of the longitudinal data on progression, it was possible to estimate projected completion rates for traditional apprenticeships. Overall, completion rates would appear to be approximately 77 per cent, after allowing for differential attrition in the sample. This is somewhat higher than the completion rate of approximately 65 per cent for entrants to traditional apprenticeships over the period from 1996 to 1999 estimated by Ball and John (2005). Some of this difference is due to characteristics of the population being surveyed. This analysis is based on young people followed through school who commenced an apprenticeship after leaving school and before they reached 19 years of age, a group that has higher completion rates than those who commence an apprenticeship when they are in their early twenties. Some of the difference may be methodological in that differential attrition in longitudinal surveys may result in an overestimate of completions and administrative sources may underestimate completion rates due to difficulties in tracking individuals across time.

There are variations across fields of training, with lower completion rates in the food and hospitality industries and in hairdressing. These completion rates are comparable with corresponding measures for other forms of post-compulsory education and training. Estimated completion rates for traineeships are similar to those for traditional apprenticeships, but it is recognised that there are problems in estimating completions from self-report data for trainees.

Some analyses in this report suggest that non-completion of a New Apprenticeship is mainly associated with changed interests, personal factors or lack of satisfaction conditions in the workplace. There is almost no discernable influence of background characteristics on persistence with an apprenticeship. However, lack of satisfaction with both off-the-job and on-the-job training was greater for trainees than for apprentices, and this may deserve further investigation.

There is an emerging emphasis on post-compulsory education and training directed to perceived shortage of skilled personnel in industries served by New Apprenticeships. Meeting the requirements for skilled labour will depend on an understanding of the factors associated with enhanced participation in the forms of training available, as well as supporting the development of effectiveness within those forms of training.

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## APPENDIX: DATA AND ANALYSIS

### The Longitudinal Surveys of Australian Youth

The *Longitudinal Surveys of Australian Youth* (LSAY) project follows the experiences of young people as they move from school into post-secondary education, training and work. The project is jointly managed by the Australian Council for Educational Research (ACER) and the Australian Government Department of Education, Science and Training.

A number of cohorts of young people have been surveyed as part of the LSAY program. The data for this report focus on the cohorts of students who were in Year 9 in 1995 and Year 9 in 1998. The initial 1995 Year 9 sample included 13 613 students. The sample was a two-stage stratified random sample. In the first stage, a national sample of approximately 300 schools, designed to represent State and sector, was selected. In the second stage, two Year 9 classes were randomly selected from each sampled school. All students within the selected classes were invited to participate in the study (Long, 1996).

The first wave of data collection occurred when the respondents were in Year 9. Students were surveyed in their school, where they completed a questionnaire about themselves and their family backgrounds, their educational and vocational plans, and attitudes to school. Reading comprehension and numeracy tests were also administered to the students, in order to provide information on early school achievement. Further data on educational and labour market participation continues to be collected from the sample members on an annual basis. Data collection was by mailed questionnaire when in Year 10 or its equivalent (in 1996), and by telephone interview in subsequent years. The surveys gathered information about students' experiences during the year of the survey, including whether or not they had left school. The number of persons responding to each survey wave is reported in Table A1. All results presented in this report have been weighted to correct for both the original sample design and subsequent attrition. A technical report by Marks and Long (2000) details the weighting procedure and another by Rothman (2005) examines the effect of attrition on bias.

**Table A1 Number of respondents to each wave of the Longitudinal Surveys of Australian Youth, 1995 Year 9 cohort**

Year	Number of respondents (unweighted)
1995	13 613
1996	9 842
1997	10 305
1998	9 733
1999	8 780
2000	7 895
2001	6 875
2002	6 098
2003	5 354

## Variables

**School completion status:** Year 12 non-completers were identified by questions in the survey instruments on whether respondents were at school and, if they were not, the year level (grade) and month in which they left school. Completers were defined as persons who commenced Year 12 and remained in school until at least August of that year.

**Year 12 VET in Schools:** Those students who studied one or more VET in Schools subjects in Year 12 have been coded to reflect this. The type of course was represented as a set of dummy variables: Year 12 with VET in Schools subjects and Year 12 with no VET in Schools subjects. The excluded or reference category was not having studied in Year 12.

**Sex:** Information on the sex of the respondents was obtained from responses to the 1995 questionnaire. In cases where this information was not provided, the students' names were used to infer the students' sex. This information was confirmed in subsequent telephone interviews.

**Parental occupation:** Sample members were asked when they were in Year 9 to report the occupations of their father (or male guardian) and mother (or female guardian), and to describe their work. If a parent was not employed at the time of the interview, respondents were asked to describe that parent's last job. Respondents were asked to provide information on both parents, even if their mother or father was not living with them. The information provided by respondents was coded to the four-digit level of the Australian Standard Classification of Occupations (ASCO), and subsequently used to create two occupational measures.

The first measure, *occupational group*, is a categorical measure. The responses were classified into four groups: professional/managerial, clerical/sales/personal service, skilled manual and semi/unskilled manual. In this report the variable father as a tradesperson was computed from this classification.

The second measure, *occupational status*, is a continuous variable. Responses were assigned occupational status scores based upon the ANU3 scale. Examples of jobs at the bottom of the ANU3 status hierarchy are various mining, construction and related labourers, forklift drivers, cleaners and product assemblers. Examples of jobs at the top of the status hierarchy are medical practitioners, university teachers and legal professionals (Jones, 1989). The ANU3 scale ranges from 0 (low status) to 100 (high status). To simplify presentation and to make best use of the available information, the occupation of the male parent was taken as the basis for both the categorical and continuous occupational measures. Where information on the occupation of the male parent was not available, the occupation of the female parent was substituted. This approach was taken because a large proportion of the respondents indicated that the occupation of the female parent was 'home duties', an occupation for which there is no occupational class or occupational prestige score.

**Parental education:** In 1995, respondents were asked to report the highest level of education completed by each parent. In this report attention focused on whether the father held a trades qualification.

**Language background:** In this report a measure of home language was recorded by asking students in the 1995 survey ‘What language does your family mostly speak at home?’ A distinction was drawn between households where the main language spoken at home was English, and households where English was not the main language spoken.

**Location** was reported in three categories (metropolitan, regional and rural/remote) based on the MCEETYA classification of locations (Jones, 2004). This classification is based on access to services and other features of a location. It is a modification of the Accessibility/Remoteness Index for Australia (ARIA) developed by GISCA at the University of Adelaide and adopted by the Australian Bureau of Statistics. In this study it was possible to code the student’s place of residence when they were in Year 9 as the basis for the index, but in practice this was almost always the same as the classification of the school location.

**School sector:** This measure refers to the school attended at the time of sample selection (Year 9), and the data for this measure were obtained from the sample design. Three categories are used: government schools, Catholic non-government schools, and non-Catholic non-government schools, identified as government, Catholic and independent, respectively.

**Literacy and numeracy achievement in Year 9:** The respondents’ scores on ACER-administered literacy and numeracy tests undertaken in Year 9 measured achievement. The tests included many items used in previous national studies of literacy and numeracy (the 1975 and 1980 ASSP studies) and in longitudinal studies of Australian young people (the 1989 *Youth in Transition* study and the *Australian Youth Survey*).

The literacy test comprised 20 items. Students were asked to read some text and then to answer several questions about what they had read. The text comprised short newspaper articles and longer textual passages. The material from newspapers included stories about a tug of war with a camel, a hang gliding flight, an armed robbery, birds trapped by dumped oil, scientific explanations of floating, and the flight of bees. The longer textual passages were on diverse topics such as the birth of a volcano, a railway worker’s near fatal experience with an express train, and a dispute between two motorists.

The numeracy test comprised 20 questions. Three broad types of questions were asked. The first type dealt with mathematical operations (mainly computations) with little or no practical component. This included simple operations such as addition and subtraction, and more complex operations such as long division, fractions, squares, cubes, and square roots. The second type of questions required practical applications of numerical skills. Examples are questions about buying things, reading scales, tables and graphs, and calculating interest. The third type of questions required the application of abstract mathematical concepts. These were mainly logical and spatial problems.

**Post-secondary education and training:** In each annual interview, respondents were asked to indicate any current participation in schooling and/or post-secondary education and training, and to provide details of qualifications completed since the last interview. For each year a variable comprising the following seven categories was generated: still at school; returned to school or studying school subjects at TAFE; in an apprenticeship/trade certificate; traineeship; other TAFE or non-degree study; bachelor’s or higher degree; and not studying. Participation in a New Apprenticeship, as well as participation in an apprenticeship and a traineeship, separately, were also created for use as independent variables in analyses.

**Field of training:** A classification of field of training was constructed from respondents' indications of the field in which they were studying and supplemented by information about the field in which they were working. Apprentices and trainees were classified into different fields of training: electronics, engineering, automotive, construction (sometimes separately for building and carpentry, plumbing and other), agriculture, food and hospitality, services (separately for hairdressing, clerical and sales and other including health and community). These categories are similar to those reported in NCVER statistics and represent the key industries that employ both apprentices and trainees. They also reflect different skill and interest requirements. They enable a consideration of the different pathways and background characteristics of individuals in different fields of study.

**Commencement and progress:** LSAY provides data about commencement in, and progress through, a course of training. In terms of commencement the data indicate the stage of schooling attained prior to commencing the training and the time that elapsed between leaving school and commencing training. School attainment was best categorised as a dichotomy: Years 10 and 11 or Year 12. LSAY contains information about progressive status through the apprenticeship or traineeship over successive years (continuing, completed, withdrew, time-out). For the purposes of the analyses in this report the focus is on the dichotomy between those who were either continuing or had completed (given other research that indicates most withdrawal is in the first year) and those who had had withdrawn or taken time-out. In the case of the older cohort it was possible to follow progress through an apprenticeship through to three years beyond Year 12 (that is, to 2001). Thus all entrants from school would have had the opportunity to reach the third year of a four-year apprenticeship. In the case of the younger cohort, the focus is on entry to apprenticeship and progress through the early stages of that apprenticeship.

**Vocational interests:** Occupational interests are captured as the six dimensions of the typology developed by Holland (1985).

- Realistic interests predispose people to prefer such activities as building or repairing things and making objects. People with realistic interests like environments which 'foster technical competencies' where they are 'encouraged to see themselves as having mechanical ability' and which typically involve using 'machines and tools'.
- Investigative interests predispose people to prefer such activities as experimenting, analysing and inquiring. People with investigative interests like environments which 'encourage scientific competence' where they are 'encouraged to see themselves as scholarly', as having 'mathematical and scientific ability'.
- Artistic interests predispose people to prefer such activities as painting, dancing and playing music. People with artistic interests like environments which 'foster artistic competencies' where they are 'encouraged to be expressive, original, intuitive, feminine, nonconforming [and] independent'.
- Social interests predispose people to prefer such activities as helping others and teaching. People with social interests like environments that emphasise 'social competencies' where they are 'encouraged to see themselves as liking to help others'.
- Enterprising interests predispose people to prefer such activities as organising and selling. People with enterprising interests like environments which 'encourage' them to 'see the world in terms of power, status, responsibility', where they are rewarded with money, power and status.

- Conventional interests predispose people to prefer such activities as record keeping. People with conventional interests like environments which stimulate them to ‘engage in recording and organising data or records’, where they are encouraged to see themselves as having ‘clerical competencies’.

**School orientation:** The school curriculum orientation was captured by a set of school-level variables:

- Socioeconomic context, represented as the mean SES for the school.
- Vocational orientation, represented as the percentage of enrolments in VET subjects at Year 12.
- Technology orientation, represented as the percentage of enrolments in technology subjects at Year 12.
- School climate, as reflected in the average attitudes to school scale score.
- School retention rate, as the percentage of the cohort from Year 9 that reached Year 12.

### **Analyses of effects on participation**

Investigations of influences on participation use multivariate analysis. Since a range of factors, rather than one factor, determines subject selection, it is important to analyse simultaneously those factors that have substantial effects on subject selection. It is necessary to examine the effects of each influence where other influences are held constant. These effects are referred to as ‘net effects’, because they are ‘net of’ the confounding influence of the other influences. Multivariate logistic regression is used in this analysis after creating dichotomous variables representing participation (or not) in apprenticeship. Logistic regression allows an estimation of the probability of an event occurring or not, after controlling for all other factors in the model. The analysis was conducted using a two-level hierarchical linear model so as to properly estimate standard errors and to examine the effects at individual and school level.

The interpretation of the results of logistic regression differs according to whether the influence is dichotomous, categorical or continuous. For categorical variables, one level must be chosen as the reference group so that comparisons can be made. For example, if males are chosen as the comparison or reference group, female participation can then be compared to male participation, other things equal. Logistic regression coefficients provide an indication of the direction and magnitude of an influence on participation. It is also possible to generate an odds ratio for each influence. The sign of the logistic coefficient indicates if the factor has a positive or negative influence, that is, whether it increases or decreases the likelihood of participation.

Odds ratios are used to provide an indication of the net influence of influence by providing, for example, the ratio of the odds of a female participating in a subject area rather than not participating in that subject area to the odds of a male participating rather than not participating. The ratio of these two ratios is called the odds ratio is derived from the logistic regression coefficient. Odds ratios are always positive. An odds ratio equal to 1 signifies no effect of the variable concerned on participation. Odds ratios above 1 indicate an increased likelihood of participation and odds ratios below 1 indicate a decreased likelihood. The further an odds ratio is from 1, the stronger the effect of the variable.

This measure has several desirable properties. First, it uses more information in describing the association between two variables; in this example being male, being female, participating and not participating. Thus it is a more 'complete' measure. Second, it has the property of 'marginal invariance'; that is, the strength of an association between two measures is not affected by their distributions. Third, odds ratios are also used to interpret the effects of factors on participation in a multivariate context.