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ABSTRACT

The occupational pathways of a representative national sample of Australian school leavers were examined over a 7-year period after leaving school. The study was based on the initial vocational interests of male (n=1436) and female (n=1273) high school pupils and formed part of the longitudinal 1970 Youth in Transition study, a national probability sample of Australian youth. The interest inventory used was a 24-item questionnaire of the Holland typology of interests. In a followup over the 7-year period, the full-time occupation was classified in terms of realistic, investigative, artistic social, enterprising, or conventional interest categories. Results indicated a major disparity between initial vocational interests and occupational destinations at the commencement of a career. Sufficient evidence was found to argue that the vocational interests of youth were not always reflected by their initial occupational pathways. The results indicated greater congruence with the passage of time and pointed toward a period of career exploration followed by consistency. (Appendixes include 27 references, 1 figure, and 3 data tables.) (Author/YLB)

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VOCATIONAL PATHWAYS OF AUSTRALIAN SCHOOLLEAVERS: A LONGITUDINAL STUDY

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The occupational pathways of a representative national sample of Australian schoolleavers were examined over a seven-year period after leaving school. The study was based on the initial vocational interests of male and female high school pupils and formed part of the longitudinal *Youth in Transition* study - a national probability sample of Australian youth. In a follow-up over a seven-year period, the full-time occupation was classified in terms of Realistic, Investigative, Artistic, Social, Enterprising or Conventional interest categories. Results indicated a major disparity between initial vocational interests and occupational destinations at the commencement of a career. There was sufficient evidence to argue that the vocational interests of youth were not always reflected by their initial occupational pathways. The results indicated greater congruence with the passage of time and point towards a period of career exploration followed by consistency.

The variation in career pathways that arises in the early years after leaving school is a familiar phenomenon for educators, researchers, career practitioners and laypersons. It is an aspect of job mobility that might be considered to reflect career development in a modern working life (Rosenfeld, 1992). For instance, analysis of labour market experiences in the United Kingdom over the period 1915-1990 indicated that British men and women held an average of five jobs (Booth & Francesconi, 1999) compared with four jobs for German men over their lifetime and around ten for males in the United States. A significant component of this overall mobility, however, was the instability in the first ten years that has been described as "job shopping" (Stigler, 1962).

In Britain around half of all the lifetime job changes occurred in the first 10 years and this proportion was similar for males in Germany, whereas for males in the United States an estimated two-thirds of all jobs occurred in that time (Booth & Francesconi, 1999, p.43; Hall, 1982; Winkelmann, 1994). More recent data from the Youth Cohort of the National Longitudinal Surveys indicated that the typical individual had 7-8 jobs between ages 18 and 30 (Bureau of Labor Statistics, 1993). Official labour force statistics in Australia also confirm that the proportions of persons who are job mobile (ie., change employers, business or location) is greater in the younger age groups. For the 15-19 years age group the proportion who are job mobile is around 18%, increasing to a maximum of 25% for ages 20-24 and declining gradually thereafter to 5% for those aged 55 years and over (Australian Bureau of Statistics, 1998, Table 4, p.15).

In the analysis of career pathways, job mobility might be identified readily with instability but it may also be characterised as a search for the most compatible environment in one's life. In this way mobility acts as a proactive force in one's career path (see Topel & Ward, 1992). While positive elements of employment mobility have been considered by some researchers, it is the levels of instability that have captured most attention and typologies of career stability and instability have

been proposed. In an Australian context Dwyer and Wyn (1998) described educational and vocational patterns as non-linear. They identified five major patterns of vocational choice and commitment by young people after leaving school:

- Vocational focus - emphasis on gaining qualifications;
- Occupational focus - emphasis on obtaining work;
- Contextual focus - emphasis on lifestyle;
- Altered patterns - changing courses, career or lifestyle; or
- Mixed patterns - valuing a range of purposes, goals, activities.

Dwyer, Harwood and Tyler (1998) followed up young people over a seven-year period after leaving school. They focused mainly on those still involved with further study (N=1309) and suggested that the largest group in the typology were the Mixed Patterns group (43%). Participants in their research were described as "negotiating reality for themselves by 'weaving' interconnections or patterns within their lives"(p.19).

On the other hand, Holland (1997, pp.64, 69) recently pointed out the inherent stability of occupational pathways. He described the snowball effects of a career and listed the many barriers that exist towards change. In emphasising stability, Holland (1997) took a longer-term view of career pathways and noted that:

> The average career is both focused and stabilized by relatively constant dispositions, special talents, expectations, irreversible choices, credentials, and other baggage that workers acquire, and by the benign and biased environments that everyone encounters at every age... stability is the norm – because workers soon become active seekers of a limited range of congruent jobs and because employers discourage change through common hiring practices and biases of age, appearance, sex, training and work history. Family friends, coworkers, and relatives also press for stability because they usually have a stake in a worker's income, friendship, and power... (pp. 12-13)

> The chief findings from the aspirational and work history studies are that the average career shows continuity (ie., a strong tendency to work in the same major area over the lifetime), that moves involve minor or related changes rather than moving among radically different kinds of work, and that there are many internal and external barriers to change... (pp. 203)

The purpose of this paper is to explore the direction of the occupational pathways of a nationally representative cohort of schoolleavers in terms of their vocational interests. The first feature of the study is that it is located within the occupational focus grouping of Dwyer and Wyn (1998). Secondly, the framework for this analysis is the Holland typology of vocational choices and occupations. This enables the classification of people and occupations in similar ways. The principal advantage of using a coherent vocational typology is that it permits assessment of consistency in career pathways. Furthermore, it does not penalise people for moving between jobs at

the outset of their working life especially when they remain within a consistent career path.

Holland's typology of vocational interests and personalities

Holland (1973, 1985, 1997) formulated six general vocational categories to encompass the world of work (Realistic, Investigative, Artistic, Social, Enterprising and Conventional). The six types are linked in a hexagonal ordering within a coherent arrangement (see Figure 1). This allows for the meaningful assessment of vocational pathways within and across the six types. The arrangement of interests around the hexagon was based on empirical research (Holland, Whitney, Cole & Richards, 1969), which identified some interests as more closely related than others. The closeness of the relationship was that adjacent interest types were thought to be more consistent than alternate interests, which were thought to be more consistent than opposite interests on the hexagon.

Insert Figure 1 about here

One importance of this typology resides in its worldwide dominance of research and practice in vocational behaviour. A practical indication of the popularity of the theory is that in its latest catalogue, the publisher Psychological Assessment Resources, has announced that over 25 million copies have been sold of the *Self-Directed Search* (an assessment of the Holland types). The Holland vocational typology has also influenced vocational research in Australia (see Ainley, Robinson, Harvey-Beavis, Elsworth & Fleming, 1994; Naylor & Care, 1997; Lokan & Taylor, 1986). This brief description hardly does justice to Holland's contributions to vocational behaviour and the reader is referred to the latest exposition of his theory (Holland, 1997).

Congruence is a key concept within Holland's theory of vocational personalities and work environments because it is associated with career stability. It is an index of compatibility and recognises that an interest type needs to be matched with an environment that provides appropriate rewards and opportunities (see Holland, 1997, p.5). Fortunately, the hexagonal arrangement allows for the

determination of congruence. As an example, a Social type in a Social environment is seen as most congruent; a Social type in an Artistic or Enterprising environment would be the next most congruent; a Social type in an Investigate or Conventional environment is only partly congruent; and a Social type in a Realistic environment would be the least congruent.

This predictive value of interests and occupations has been studied in various age groups. In an early study, McLaughlin and Tiedeman (1974) followed up Year 12 students after 1, 5 and 11 years. They reported that the category of aspirations predicted around 58% after the first year down to 39% after 11 years. L. S. Gottfredson (1979) showed that around 70-80% of year-to-year aspirations of males aged 16-28 years were within the same Holland category. Studies of census data also showed that for both males and females there is an increase in career stability over time and that many job changes involve transitions within the same major Holland type (see G. D. Gottfredson, 1977; L.S. Gottfredson & Becker, 1981). Finally in a study of Australian workers the Holland category of a worker's first occupation was reported to be an effective indicator of the category of occupation some 5 and 10 years later (Melamed & Meir, 1981). Accordingly there appears to be some potential for investigating the stability of pathways within vocational interest types to determine whether they are as consistent as described by Holland or as non-linear as described by Dwyer and Wynn (1998).

Youth in Transition

This study uses the *Youth in Transition* data, which is an ongoing study of the vocational pathways of young Australians. The survey is made up of a cohort of young people born in 1970 and forms part of the Longitudinal Surveys of Australian Youth conducted by the Australian Council for Educational Research. The objective of the surveys was to indicate the main factors that affect personal, educational, vocational and social outcomes. A two-stage stratified probability sample involved 25 students randomly selected from a nationwide sample of schools that included government, independent and Catholic school systems. Participants were first contacted in schools and further data collection was by an annual mail survey over a ten-year period. The 1970 cohort is used in this study and was first assessed in 1980

and then followed up at yearly intervals from 1985-1994. Lamb, Polesel and Teese (1995, p.27) went so far as to say "...it represents one of the most substantial long-term studies of outcomes undertaken in Australia". This study used this historical database to address the key research question of the extent to which one's vocational interest is reflected in the subsequent type of job(s) undertaken in the early part of a career.

METHOD

Participants. The participants in this study comprised pupils (males=1436; female=1273) from the 1970 Youth in Transition study cohort, who were first tested as part of the Australian Studies of School Performance in 1980. When contacted again in 1985 the mean age of the sample was 15.5 years (SD=0.3). Participants were followed up by mail annually and this study includes only those who were working full-time. The numbers of participants varied from a minimum of 846 in 1985 to a maximum of1236 in 1988 (1985 – 846; 1986 – 1077; 1987 – 1042; 1988 – 1236; 1989 – 1163; 1990 – 1082; 1991 – 1201).

Instrument. The interest inventory used in this study was a 24-item questionnaire of the Holland typology of interests developed especially for administration by mail. It formed one of the twelve sections of a larger survey. Pupils were asked 'How do you feel about each of these activities?' and responded on a four point scale from 'like very much' (1) to 'like somewhat' (2) through to 'dislike somewhat' (3) and 'dislike very much' (4) for items such as: bushwalking, working with machines and tools (R), doing all kinds of experiments (I), acting in plays (A), helping others (S), managing other people (E) and doing office work (C), (see Australian Council for Educational Research, Longitudinal Surveys of Australian Youth, Technical Paper Number 5 for a complete copy of the survey questionnaire; a copy of the interest questionnaire is available from the author upon request). Due to restrictions of both space and response time the questionnaire was limited to four items per scale and designed for moderate levels of internal consistency with alpha coefficients for the six RIASEC scales of 0.802, 0.602, 0.636, 0.545, 0.641, and 0.704 respectively. The questionnaire has been used subsequently in other large-scale studies and validated against subject

choice (Ainley, Robinson, Harvey-Beavis, Elsworth & Fleming, 1994). The six scales were analysed using a Rasch measurement model and scores for each scale were reported in logits. The largest Rasch score across the six RIASEC categories determined the high point code for each person (Athanasou, in press).

Procedure. A follow-up mail survey was used to obtain the occupation of those who were working. Respondents were classified in terms of their Holland high-point code (RIASEC). Cross-tabulations were computed between the person's Holland high point code and the RIASEC code for the person's job over a seven-year period. This was only undertaken for those persons who were working at the time of the follow-up survey. Cross-tabulations were adjusted for base rates of responding by the expected values for each cell, as in a chi-square analysis.

Analysis. A randomisation test (Tracey, 1997) was then used to test the hypothesised ordering of relationship in the RIASEC hexagonal model. This compared the predicted hexagonal relationship between categories such as RI with RA RS RE RC IA IS IE IC AS AE AC SE SC EC. A correspondence index ranging from –1 through 0 to +1 indicated the extent of agreement. Further details of the analysis are contained in the results section.

RESULTS

Overall findings

Table 1 shows the distribution of participants in the original sample and in the subsequent years. The pupils were classified by their high-point code on the interest questionnaire and in subsequent years by the Holland high-point code for their occupation. The final column of Table 1 indicates the estimated proportion of employees classified by the Holland code in the Australian labour force.

Insert Table 1 about here

The Realistic category increased its share of vocational pathways throughout the period from 25% to 31% of respondents and this may reflect the large range of unskilled, semi-skilled and skilled occupations involving outdoor, manual, technical

and practical work activities in the Australian labour market. The large and initial drop in the percentage of Investigative (ie., scientific, medical) interests from 12% down to 0% may reflect the long lead time required for entry into many of these professional and para-professional occupations. Even then it is clear that many individuals with Investigative interests either had not finished their training by 1991, or were not able to locate work in this field. A similar pattern applied to Artistic interests with 6% of persons indicating this as their highest interest at the outset, but only 2% remaining in employment in this field in 1991. The largest absolute as well as relative change in interests is seen in the Social category (ie., social service, welfare, people contact occupations) which declined from a high of 41% at the outset to 10% in 1991. Significant increases were observed for the Enterprising interests (ie., business, entrepreneurial and persuasive activities) from 11% to 18% but the most substantial increase was reserved for Conventional interests (ie., clerical, office and computational work activities) which increased their share from 4% to 34%. This reflects in part the significant proportion of clerical and office work activities in Australian employment.

Congruence between original interest type and follow-up in 1991

The congruence between the initial high point interest codes and those at follow up in 1991 were available for 1201 persons. Only 21% (256 out of the 1201) were in identical high point codes at the outset and in 1991. These are shown in Table 2 (127 out of 369 in the Realistic category; 6 out of 64 for Investigative; 5 out of 21 for Artistic; 65 out of 120 for Social; 23 out of 218 for Enterprising; and 30 out of 409 for Conventional types). Congruence rates for subsequent years remained fairly constant (1985 – 21%; 1986 – 18%; 1987 – 19%; 1988 – 19%; 1989 – 21%; 1990 – 21%; 1991 – 21%). However, this type of comparison does not take into account the predicted movement to adjacent, alternate and opposite types around the Holland hexagonal arrangement where individuals may move to the next most congruent type. This was tested in the correspondence analysis for all 28 possible comparisons between every year from 1985 to 1991.

Insert Table 2 about here

Correspondence analysis

Table 3 (a) indicates the correspondence across time between the high point codes for interests and occupations in subsequent years in terms of the hexagonal arrangement of interests. Tables 3(b)-3(g) indicate the correspondence between the high point code for the occupation in a particular year and the high point code for the occupations in subsequent years.

There was no clear pattern in a participant's vocational type and their subsequent career pathways. The results indicated considerable instability in terms of the hexagonal ordering of interest types. Only six out of the 28 correspondence indices were significant ($p<0.05$). From 1987-1990 which account for the last three years of the period under review, there was some evidence of greater stability for adjacent years (ie., 1990 and 1991; 1989 and 1990; 1988 and 1989). At this time members of the cohort would have been aged around 19-21 years.

Insert Table 3 about here

DISCUSSION & CONCLUSIONS

The findings from this study indicated that the vocational interests of high school pupils in Australia were only partly consistent with their career pathways over a six-year period. Around 21% remained in identical vocational categories at the outset and seven years later. There was support, however, for aspects of a non-linear occupational focus that was advocated by Dwyer and Wynn (1998).

Movement into other categories of work did not correspond to the predicted order in the Holland hexagonal typology. Initial pathways did not support the concept of career stability but the later proximal pathways in adjacent years began to show some correspondence. This finding was consistent with a study analysing male career development which concluded that one's present occupation is a better predictor of future occupation than other factors (L.S Gottfredson & Becker, 1981).

It seems possible that even though the pathways people chose did not conform to the predicted hexagonal ordering of interests in the Holland typology they tended to reflect the structure of opportunities in the Australian labour market. One possible

inference that may be made is that the original distribution of interest types amongst schoolleavers is unlikely to find satisfaction in the types of employment offered by the workforce. Those persons with high Investigative, Artistic or Social interests seem unlikely to find sufficient employment opportunities; whereas the dislike of Conventional (ie., office work) interests is oversupplied with opportunities in the modern Australian workforce. In part, this mismatch between schoolleaver interests and workforce capacity to satisfy these interests might account for some but not all aspects of the instability that characterises the early years in the workforce. Nevertheless, the career pathways are not entirely random and they certainly do display some order and a degree of congruence but it is difficult to account for all the varied directions of "job shopping".

An advantage of this study is that it used a coherent and consistent theoretical classification for both persons and jobs. This facilitated meaningful comparisons across time. Moreover, the advantage of using a broad vocational typology is that it allowed individuals to change jobs or industry but to still remain within the same Holland cluster. The use of correspondence analysis went further than assessing the congruence of high point codes to test the consistency of mobility or transfer within the hexagonal arrangement of interests.

A further advantage of this study was the large national probability sample but a limitation was the high drop-out rate of participants. This is characteristic of many follow-up studies based on mailing of responses and has now been overcome by use of telephone follow-ups. Secondly, the study was also dependent upon the validity of the results from a brief assessment of vocational interests that had only moderate reliability. Different results might have been obtained using longer scales to assess vocational interests. Thirdly, there was no way of controlling for factors other than interest that might also impinge upon mobility, such as opportunities or educational achievement. Further studies may also need to consider other constructs within the Holland theory such as combinations of congruence, consistency, differentiation, identity and educational level. Fourthly, the study was undertaken during a period of economic recession with high youth unemployment and this artifact may have influenced vocational pathways. Finally, the historical nature of the data may limit any generalisation to future labour markets.

This study showed that around one-fifth of high school pupils demonstrated some congruence in interests and occupations in the early stages of their career, and demonstrated that there was considerable variation in the initial career pathways. In one sense it is remarkable that there is any stability in careers, given the myriad of potential influences likely to destabilise any life. Given that the cost (personal, social, economic) of occupational change is great and increases over time then one of the few periods when it is most feasible for an individual to experiment is at the earliest periods of career development. Career mobility or instability may be a positive attempt to find a more conducive working environment but a disturbing aspect of these results for career practitioners is that the modern workplace may not allow the fulfillment of the vocational interests of high school pupils and may encourage instability in career pathways.

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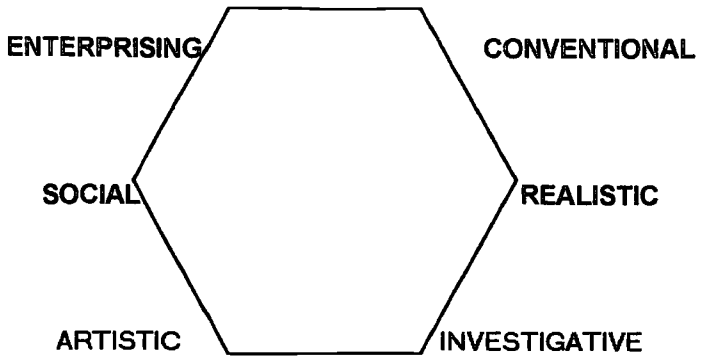

Figure 1 Holland's hexagonal ordering of occupational types

TABLE 1

Percentage distribution of the Holland high-point codes of participants and their occupations surveyed 1985-1991

Holland type	Original	1985	1986	1987	1988	1989	1990	1991	Employed persons Australia[1]
Realistic	25%	38%	33%	38%	35%	36%	34%	31%	44%
Investigative	12%	0%	0%	1%	2%	3%	3%	5%	5%
Artistic	6%	1%	1%	1%	1%	2%	1%	2%	3%
Social	41%	1%	1%	2%	4%	5%	7%	10%	8%
Enterprising	11%	43%	42%	32%	29%	23%	20%	18%	16%
Conventional	4%	17%	23%	27%	30%	32%	35%	34%	24%
TOTAL	3275	846	1077	1042	1236	1163	1082	1201	8,319,700

All percentages rounded; columns contain different samples; and not all participants were working from 1985-1991; [1]Source: Australian Bureau of Statistics, Labour Statistics Australia, Catalogue No. 6101.0, August 1996, p.74

TABLE 2

Congruence of the Holland high-point codes of participants at the outset and in 1991

	1991					
1985	Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Realistic	127	12	3	21	39	72
Investigative	81	6	1	10	24	39
Artistic	10	9	5	10	17	22
Social	97	31	10	65	106	208
Enterprising	44	4	2	8	23	38
Conventional	10	2	0	6	9	30
Total	369	64	21	120	218	409

TABLE 3

(a) Correspondence indices for original Holland interest code and occupations in subsequent years

Year	Predictions met	Predictions tied	Correspondence Index	Probability
1985	163	18	.2242	.5125
1986	167	5	.2064	.3708
1987	202	3	.4484	.0250
1988	195	4	.4021	.0486
1989	197	4	.4164	.0917
1990	166	2	.1886	.5667
1991	201	4	.4448	.0556

(b) Correspondence indices for 1985 occupation and subsequent occupations

Year	Predictions met	Predictions tied	Correspondence Index	Probability
1986	182	21	.3701	.3653
1987	132	30	.0463	.9639
1988	172	19	.2918	.4528
1989	159	21	.2064	.5917
1990	113	26	-.1032	.9903
1991	149	15	.1139	.7694

(c) Correspondence indices for 1986 occupation and subsequent occupations

Year	Predictions met	Predictions tied	Correspondence Index	Probability
1987	174	13	.2847	.6875
1988	186	12	.3665	.3875
1989	182	5	.3132	.3736
1990	114	11	-.1495	.7250
1991	202	4	.4520	.1431

(d) Correspondence indices for 1987 occupation and subsequent occupations

Year	Predictions met	Predictions tied	Correspondence Index	Probability
1988	205	5	.4769	.0778
1989	212	4	.5231	.0208
1990	221	3	.5836	.0264
1991	206	4	.4804	.1042

(e) Correspondence indices for 1988 occupation and subsequent occupations

Year	Predictions met	Predictions tied	Correspondence Index	Probability
1989	210	0	.4947	.0472
1990	205	4	.4733	.1514
1991	205	5	.4769	.1056

(f) Correspondence indices for 1989 occupation and subsequent occupations

Year	Predictions met	Predictions tied	Correspondence Index	Probability
1990	223	0	.5872	.0028
1991	206	1	.4698	.1042

(g) Correspondence index for 1990 occupation and subsequent occupation

Year	Predictions met	Predictions tied	Correspondence Index	Probability
28	211	2	.5089	.0528

All cross-tabulations adjusted for base rate of responding

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