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Senior secondary school students' risk of disengagement from further education, employment or training

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Abstract

In Western Australia, the school leaving age was mandated to rise from 15 Years to 16 Years in 2007. This policy has resulted in a large number of students remaining at school and entering the senior years of schooling. Of interest in this study were the students who would not normally have remained at school, particularly those who may have disengaged from schooling. A survey instrument was administered to collect data about these students. Data were obtained from school and education district office student services staff on 23 attributes of 5313 Year Ten students identified at risk of not completing schooling, future training or entering employment. The data were dichotomous and the multi-variate nature of these data rendered it unsuitable for Rasch Model analysis but amenable to interpretation using Binomial Logistic Regression. Two models were tested with each containing a different dependent variable and common independent variables. The dependent variables for the respective models were: Model 1 - Student Risk of Disengagement; and Model 2 - Student Severe Risk of Disengagement. The study identified particular student attributes perceived by school and district office student services staff that statistically predicted two levels of disengagement with schooling, future training or future employment.

Background

Introduction

The effects of students not remaining at school on the economy, society, and social institutions at international, national, and local community levels have been well documented (see De Sousa and Gebremedhin, 2004; Johnson, 2004; Kovacs, 1998; Prosperity Secretariat, 1992; Teachman, Paasch, and Carver, 1996). A recurrent theme is the long-term effects on disadvantaged groups – those characterised by poverty or lack of skills and qualifications to gain and retain employment.

In Australia, benchmark Commonwealth, State and Business funded reports delivered during the 1990's and early C.21st (DEST, 2001; Dusseldorp, 2002; MCEETYA, 2002; and Lamb, Walstab, Teese, Vickers, and Rumberger, 2004) estimated that the economic cost to Australia from students failing to complete 12 years of education was $2.6 billion (estimated $2.9 billion for 2006). Subsequently, all States and Territories initiated plans to raise the school leaving age from 15 to 17 years of age. Whilst work toward this aim is ongoing throughout the country, an acute skills shortage in Western Australia in particular led the State Government to fast-track relevant legislation. In November 2005 the *Acts Amendment (Higher School Leaving Age and Related Provisions) Act 2005* was passed with bipartisan support to amend the *School Education Act 1999* by extending the compulsory period of education and broadening the range of educational, training and employment activities available to students. The legislation took effect in January 2006 with the school leaving age being raised from 15 to 16 years of age. The leaving age will be raised again from 16 to 17 years in January 2008. In 2006, the Western Australian State Government allocated $10.1 million rising to $182 million by 2010 for implementation of the legislation.

It is therefore timely to critically examine the impact of the resulting changes on Western Australian education and training. As part of this ongoing research, the 2006 Years 10 and 11 students who in past would have likely not engaged in further education, training or employment were investigated. The characteristics of these students and of their backgrounds associated with risk and severe risk of future disengagement were empirically identified.

The influences on disengagement and school leaving

The literature concerning student decisions to remain at school can be viewed in terms of the influences on disengagement with schooling. These influences are broadly the effects of: national policies and state policies, the local community, the student's family, peers, features of the school and its programs, and attributes of the individual student (see Lamb, Walstab, Teese, Vickers, Rumberger, 2004). With regard to national and state policies, it was noted in the previous brief explanation of the Australian and Western Australian press for policy and legislative change that state governments have mandated increases in the school leaving age. Consequently, the presence (or absence) of legislation requiring students to remain at school for twelve years is no longer a variable influencing retention, particularly in Western Australia which implemented the increase in 2006. For this reason the following sections of the report focus on the influence of the local community, the family, peers, the school, and characteristics of the individual student.

Local community factors

Across Australia, other things being equal, "students living in non-metropolitan areas are more likely to leave school before completing Year 12" (Marks and Fleming, 1999, p. 19). Similarly, while there is variation in school attendance by 16-year-olds across rural Australia, the attendance at school in inland regions is below average compared to coastal regions (Bureau of Rural Sciences, 1999). Likewise, Ball and Lamb (2001, p. 3) stated:

> "Young people who live in urban areas are more likely to remain at school than those who live in regional centres,[and] …Of those living in rural or remote areas of Australia, 29 per cent did not complete Year 12. This rate was almost double that for young people living in urban areas (16 per cent)".

Jones (2002) also studied the effect of geographical location on educational participation and outcomes for over 26,000 Australian students and presented a different view of school completion. Notwithstanding the small sample sizes and the small number of schools from which the remote-area students were selected, it was surmised that: "It is impossible to conclude … that students from *Remote* areas experience lower rates of Year 12 completion than students from other non-metropolitan regions" (Jones, 2002, p. 22). With regard to differences in early school leaving between the five regions investigated, regional variation was significant when examined independently and this was attributed to associations with characteristics including: "… lower attainments in Year 9 reading comprehension and numeracy (more likely to leave), non-English speaking background at home (less likely to leave), gender (boys more likely to leave than girls) and, for girls only, Indigenous identification (more likely to leave)" (Jones, 2002, p. vii). Jones (2002) concluded that the effects of regional characteristics were relatively weak predictors of early school leaving and Marks and Fleming (1999) noted that the effect applies only males.

For Aboriginal and Torres Strait communities, "Young people from Indigenous backgrounds had much higher rates of non-completion than children from non-Indigenous backgrounds. One in every two children from Indigenous backgrounds did not complete Year Twelve compared with one in every five children who were non-Indigenous" (Ball and Lamb, 2001, p. 2). Similarly, Marks and Fleming (1999) found that Aboriginal students were more likely to leave school early, even when controlling for socioeconomic background and school achievement. Fullarton (2002) investigated the influence of individual and school-level factors on student engagement with school for a nationally representative sample of Australian Year Nine students. Her study revealed that students of Aboriginal and Torres Strait Islander background had lower levels of engagement.

One of the strategies applied to increase retention of students is participation in workplace learning. In the government sector, participation in workplace learning is greatest amongst students in rural and remote areas, and particularly among students in the lowest achievement quartiles in reading and numeracy (Fullarton, 1999).

Family factors

The home language background of students affects continuation of schooling with students from a language background other than English more likely to continue

to Year Twelve (Khoo and Ainley, 2005). These students also have comparatively high rates of completion (Lamb, Dwyer, and Wynn, 2000) and are much less likely to participate in school workplace learning programs than those with an English-speaking background (Ball and Lamb, 2001).

The socioeconomic background of students' affects their school engagement levels with non-completing students much more likely to come from lower socio-economic status backgrounds (Lamb, Dwyer, and Wynn, 2000; Lamb et. al., 2004). However Fullarton (2002, p. 39) cautioned:

> "…there is a strong possibility that the effect of socioeconomic status is multiple, in that it also affects the school that a student attends and therefore the environment that a student is exposed to … it also affects the financial resources that a family has available to allow young people to participate in a wide range of activities at school, or to attend a particular school which has a strong focus on students participation."

MacMilllan and Marks (2003) found that during the mid to late 1990s, young people from highly educated families were less likely to leave school early notwithstanding a weakening relation between parent education and school leaving over the previous decade. Similarly, Lamb, Dwyer, and Wynn (2000) noted that non-completers were more often from families where the parents had little schooling. Likewise, Fullarton et.al. (2003) found parental education was also related to Year Twelve participation. The related family factor of the occupations of parents is also associated with participation. Fullarton et. al. (2003) showed that students with parents in professional occupations show higher rates of Year Twelve participation; and Lamb, Dwyer, and Wynn (2000) revealed that non-completers were more often from families where the father had a manual rather than professional or managerial occupation. The associated factor of low family income is also related to non-completion (Lamb, Dwyer, and Wynn, 2000). One explanation for this effect is that children from poorer families are more likely to be low achievers at school and it is low achievement rather than family income that accounts for the non-completion (Lamb et. al., 2004). Also, for these students, poor attendance rates and frequent change of school affect achievement (Lamb et. al., 2004).

Peer influence

Fullarton, (2002) viewed interaction with peers as a school variable that shaped student perceptions of school and classroom climate and she found that students with positive view of school and classroom climate were more likely to have higher levels of engagement. Lamb et. al. (2004) took a similar view and saw student engagement with school as a function of social as well as academic factors. In particular, social engagement which was explained as:

> "… conformity with the norms of the school as an institution (i.e., attending school and sustaining appropriate behaviour in class and in the playground) as well as to informal aspects of engagement such as peer relationships and getting on with teachers." (p.30)

Lamb et. al. (2004) also drew attention to negative forms of peer relations such as harassment, bullying, and racist behaviours (name-calling, verbal abuse, exclusion, and physical violence) and how these adversely affect achievement and decisions to

remain at school. They also noted that peer pressure from the student's immediate social group affects decisions to remain at school.

School factors

In general, organisational and instructional features of schools have been associated with Australian students not completing formal schooling. Lamb et. al. (2004) statistically modelled the influence of student, family, school, peers, and school engagement on whether or not students remained at school until August in their twelfth year for a sample of approximately 12,000 Australian students. The findings revealed that the likelihood of students remaining to Year Twelve was related to school setting variables - the intake of schools (socio-economic status of students and previous student educational achievement), type of school (government, Catholic or independent), quality of teachers (strong content knowledge of subject taught, expertise in teaching, and strong interest in students). Student engagement or student school orientation factors were also found to be influential - aspirations and intentions to remain at school while still in junior schooling, earlier academic achievement, academic motivation, and academic self-concept. Significantly: "The engagement block of factors not only have strong independent effects on retention, they also transmit or relay the effects of the individual, family, school and peer factors" (Lamb et. al., 2004, p. 144).

Specifically, school provision of appropriate curricula increases the likelihood of students retaining their interest and engagement. For example Lamb, Dwyer, and Wynn (2000) found that general satisfaction with schooling in conjunction with perceived relevance of studies and sense of achievement were higher in schools in which new curricula were implemented. In terms of satisfaction with teaching, students may also decide to leave school because of a negative teacher/student relationship and boredom with schoolwork (Dwyer, 1996). With regard to the attitudinal dimension of the school curriculum, Khoo and Ainley (2005) investigated the attitudes, intentions and participation of 13,000 Australian Year Nine students. They concluded (p. 18): "… the nurturing of favourable attitudes to school provides an important avenue for influencing participation through school and into education beyond secondary school".

Individual student factors

Low academic achievement is a predictor of school non-completion (Ross and Gray, 2005) and students who experience difficulty with their learning in the initial school years tend to get frustrated, lose motivation and become overwhelmed before dropping out of school (Kaplan, Peck, and Kaplan, 1997). In particular, proficiency in literacy and numeracy has a direct influence on participation. Khoo and Ainley (2005) interpreted this as indicating that:

> "…capable students who do not intend to proceed with education may decide to continue, and that students who intend to continue but who are not proficient may decide not to continue in education. However, these direct effects are much smaller than the effects that operate through intentions." (p. 18)

Student gender has also been shown associated with decisions to leave school and with many of the previously discussed influences on disengagement or non-participation. For example, Fullerton's (2002, p. 39) research found that gender was a

strong influence on: "… students' engagement, with females showing significantly higher levels of engagement than males; in all school sectors, in coeducational as well as single-sex schools, and at all achievement levels". Lamb et. al. (2004) considered the gender gap in non-completion of school as a consequence of differences in labour market opportunities available to young men and women; because girls are more at risk of unemployment, and thus decide to remain at school longer than boys.

Importantly, Fullarton (2002) considered that many of the male-specific and female-specific influences on engagement could be manipulated by schools to ameliorate gender difference effects:

> "For males, attention in schools needs to be paid to classroom and school climate. Males appear to need more of a supportive school and classroom environment to be engaged with their school. They need to be strongly encouraged by their schools and by their parents to participate in extracurricular activities, and a broader range of activities developed by schools that are appealing to young males. For females, schools need to focus on developing a strong self-concept of ability and positive views of school climate. Whilst for males, parents' educational level, and for females, socioeconomic status, are not malleable, their effects are small compared to the effects of overall high levels of school engagement." (p. 33)

Conclusion

The preceding examination of research into the factors that influence risk of student disengagement and non-participation presented these discretely which might be interpreted as suggesting a lack of relations between the factors. This is not the case as Lamb et al (2004, p. 28) assert: "Risk factors combine in a multiplicative fashion. Therefore, they need to be considered simultaneously, not separately". Batten and Russell's (1995, p.50) elaborated:

> "It is indeed very difficult to define relationships between risk factors and educational outcomes with precision because the relationships are highly complex, and ultimately, not known. One thing is clear, however: the concept of single cause-effect relationships in this area is a nonsense. … Relationships need to be viewed as forming a dense and complex web of inter-related, interacting, multi-directional forces."

Research objectives

The problem investigated was the anticipated dependency of the risk of student future disengagement with education, employment or training on current conditions of the student. For example, dependency of future risk on current alienation and disengagement, low school attendance, substance abuse, personal abuse, or relationships problems.

The primary research question was: What is the likelihood of students being identified at risk and severe risk of *not* being engaged in further education, employment or training being dependent on current conditions?

The research hypotheses were:

- Hypothesis One: Students identified at risk of *not* being engaged in further education, employment or training are more likely to be characterised by current conditions than those students not identified at risk; and
- Hypothesis Two: Students identified at severe risk of *not* being engaged in further education, employment or training are more likely to be characterised by current conditions than those students not identified at severe risk.

Theoretical frame

The factors influencing risk of disengagement that were discussed in the Background section of this report were examined to identify conditions of students that were likely amenable to change through school-based or education district-based intervention. For example, achievement at school can be improved by remediation whereas parental employment is dependent on factors extraneous to school operations.

Students at risk of *not* being engaged in future education, employment or training (NEET) were assumed to be experiencing one or more of the following conditions:

1. Alienation and Disengagement - Current alienation and disengagement: student not in education, training or approved work;
2. Low Attendance Rates - Attendance rates at school below acceptable participation (<80%);
3. Substance Abuse - Drug and/or substance abuse or dependency;
4. Experiencing Personal Abuse - Young person experiencing personal abuse;
5. Family Relationship Breakdown - Family relationship difficulties or breakdown (e.g. homelessness or the risk of it);
6. Personal Relationship Problems - Personal relationship problems;
7. Group Relationship Problems - Group relationship problems (e.g. gang membership);
8. Risk or History of Self Harm - Risk or history of self-harm;
9. School: Individual Relationship Breakdown - School: Individual relationship breakdown (e.g. suspension/exclusion, conflict with school personnel, bullying/harassment; student may be victim or perpetrator);
10. Poor Literacy and Numeracy Skills - Very poor literacy and numeracy skills and academic achievement levels (read as functionally illiterate and/or innumerate – Level 2 or weaker, in Curriculum Framework terms; i.e. not beyond and perhaps not at middle primary achievement levels);
11. Criminality - Criminal activity: Justice system intervention required or occurring and school/training access denied or inappropriate;
12. Personal Psychological Problems - Personal psychological problems (e.g. anger mismanagement, low self-esteem, sexuality issues);
13. Learning Difficulties - Learning difficulties;
14. Mental Illness - Mental illness;
15. Physical Disability - Physical disability;
16. Environmental Rejection - Environmental rejection: the school, training or work environment is the problem for the student, rather than the program/job in itself. (The issue is not the program; it is the environmental context or place where the program happens.);

17. Migrant: Language and Culture Conflict - Migrant: ESL/ESD language and culture conflict (eg, West African humanitarian refugee; Vietnamese group identity);
18. Pregnancy or Parenting - Pregnancy or parenting, single;
19. Gifted and /or Talented Beyond - The student is 'gifted and/or talented' beyond or outside of existing programs and/or contexts;
20. Alternative to Available Modes - The student is 'alternative' to available modes and contexts in learning style or orientation;
21. Laziness / Lack of Discipline - Poor motivation/recalcitrance/lack of self- or imposed discipline (though an appropriate program fit may be available);
22. Education Support - Education Support; and/or
23. Migrant Personal Trauma - Migrant: personal trauma from birth-country experience.

Research methods

An electronic survey instrument including 23 items on conditions assumed to be experienced by students deemed at risk of *not* being engaged in education, employment or training (NEET) was completed by District Education Office student services staff (qualified psychologists and social workers). In addition two 'global' items were included – risk of disengagement and severe risk of disengagement.

The survey instrument was designed to gather data to inform government strategic planning and the risk condition items comprised one section of the total instrument. The respondents (student service staff) were asked to initially identify students from the Years 10 and 11 student population they considered as being most at risk of *not* being engaged in education, employment or training – the most at risk 5% of students in each year cohort. Then they entered data on these students directly into an electronic spreadsheet by 'pressing' the response button for the item if the condition described in the item applied to the student under assessment.

The data were de-identified for processing by the researchers although the Western Australian Department of Education and Training (DET) retained identified data within their organisational data-base. Data collection and storage procedures were compliant with DET policies and guidelines on data management and security. The respondents were informed of confidentiality requirements in the survey instructions.

Data were collected on 5313 students from all 14 government school districts in Western Australia. The sample comprised 2413 female students and 2900 male students. Complete data were obtained for all 25 items.

The dichotomous responses (Yes/No) were scored as '1' for affirmative and '0' for non-affirmative and entered into SPSS 14.0 (SPSS, 2006). Data were analysed by the Binary Logistic Regression method. Logistic regression predicts a dependent variable on the basis of categorical independent variables and is applied to determine the percent of variance in the dependent variable explained by the independent variables. The Binary Logistic regression technique is applicable when the dependent variable is a dichotomy. Logistic regression applies maximum likelihood estimation after transforming the dependent variable into a logit variable (the natural log of the odds of the dependent variable being affirmed). In this study, the dependent variables

which concerned student risk of disengagement from education, employment or training were scored dichotomously and thus the data were amenable to analysis by the Binary Logistic Regression method.

Two models were tested with each containing a different dependent variable and common independent variables. The dependent variables for the respective models were:

- Model 1 - the dependent variable was Student Risk of Disengagement (Item 2); and
- Model 2 -the dependent variable was Student Severe Risk of Disengagement (Item 23).

The independent variables specified in both models were: Alienation and Disengagement; Low Attendance Rates; Substance Abuse; Experiencing Personal Abuse; Family Relationship Breakdown; Personal Relationship Problems; Group; Relationship Problems; Risk or History of Self Harm; School: Individual Relationship; Breakdown; Poor Literacy and Numeracy Skills; Criminality; Personal Psychological Problems; Learning Difficulties; Mental Illness; Physical Disability; Environmental Rejection; Migrant: Language and Culture Conflict; Pregnancy or Parenting; Gifted and /or Talented Beyond; Alternative to Available Modes; Laziness /Lack of Discipline; Education Support; and Migrant Personal Trauma.

SPSS 14.0 estimates a variety of statistics to assist in interpreting the results of Binary Logistic Regression analyses. First, the Classification Table summarises the overall number and percentages of predicted variable data points for the two categories of the predicted variable. The Overall Percentage shows the percent of cases for which the dependent variables was correctly predicted given the model.

Second the Wald statistic is computed to test the significance of the independent variables (the constant).

Third, for each step in an analysis, the Log Likelihood, Cox and Snell's R-Square, and Nagelkerke's R-Square are estimated. The -2 log likelihood is used to compare the fit of the model tested with the empty model. The Log likelihood is the probability that the observed values of the dependent variable may be predicted from the observed values of the independent variables. Cox and Snell's R-Square interprets multiple R-Square based on the likelihood so its maximum value is typically but not always less than 1.0. Nagelkerke's R-Square is a modification of the Cox and Snell coefficient that ensures R-Square can vary from 0 to maximum of 1. It should be noted the Cox and Snell coefficient and the Nagelkerke coefficient are ‘pseudo’ R-Squares in comparison to R-Square (the proportion of variance explained by the predictors) as calculated in ‘normal’ regression analyses.

Fourth, the sub-table of Variables in the Equation presents for each independent variable and the constant, the Un-standardised Logit Coefficients (B), the Wald statistics, and the Output Odds Ratio (Exp[B]).

The Un-standardised Logistic Regression Coefficients (B) are also termed Logit Coefficients (logits), Effect Coefficients, or Parameter Estimates. In Binomial Logistic regression these are logits for the explanatory variables used in the logistic

regression equation to estimate the log odds that the dependent variable equals 1. These estimates tell the amount of increase (or decrease, if the sign of the coefficient is negative), in the predicted log odds of the dependent variable = 1 that would be predicted by a 1 unit increase (or decrease) in the predictor, holding all other predictors constant.

The Wald statistic for dichotomous independent variables is the squared ratio of the Un-standardised Logit Coefficient to its standard error.

Because the Logit Coefficients are in log-odds units, they are often difficult to interpret, so they are converted into odds ratios. The Output Odds Ratios (Exp[B]) is the exponentiation of the Logit Coefficient. This shows the odds that the dependent variable will change for every one unit change in the independent variable. Thus the Output Odds Ratios shows the relative strength of the independent variables which enables the importance of these variables to be compared.

Results

The results of testing the two models by Binary Logistic Regression analysis are presented in Tables 1 and 2.

Table 1

Binary regression analysis: Dependent variable Item 2 - Risk of disengagement

Classification Table(a,b)

	Observed		Predicted		
			Item 2		Percentage Correct
			0	1	
Step 0	VAR00002	0	3482	0	100
		1	1831	0	0
	Overall Percentage				65.54
a	Constant is included in the model.				
b	The cut value is .500				

Wald Chi-Square test

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-0.64	0.03	495.74	1.00	0.000	0.53

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1.00	5078.77	0.283	0.390

Variables in the Equation

Item	Condition	B	S.E.	Wald	df	Sig.	Exp(B)
1	Alienation and Disengagement	6.14	0.58	112.36	1.00	**0.00**	464.00
3	Low Attendance Rates	0.54	0.07	61.76	1.00	**0.00**	1.72
4	Substance Abuse	0.50	0.12	16.84	1.00	**0.00**	1.65
5	Experiencing Personal Abuse	-0.41	0.23	3.33	1.00	0.07	0.66
6	Family Relationship Breakdown	0.02	0.09	0.04	1.00	0.85	1.02
7	Personal Relationship Problems	-0.01	0.11	0.00	1.00	0.96	0.99
8	Group Relationship Problems	0.05	0.12	0.18	1.00	0.67	1.05
9	Risk or History of Self Harm	0.18	0.18	0.96	1.00	0.33	1.19
10	School: Individual Relationship Breakdown	-0.15	0.10	2.24	1.00	0.13	0.86
11	Poor Literacy and Numeracy Skills	-0.08	0.08	1.07	1.00	0.30	0.92
12	Criminality	0.67	0.15	20.91	1.00	**0.00**	1.95
13	Personal Psychological Problems	-0.12	0.11	1.33	1.00	0.25	0.88
14	Learning Difficulties	0.13	0.10	1.47	1.00	0.23	1.14
15	Mental Illness	0.16	0.20	0.66	1.00	0.42	1.18
16	Physical Disability	-0.20	0.23	0.79	1.00	0.38	0.82
17	Environmental Rejection	0.24	0.13	3.36	1.00	0.07	1.27
18	Migrant: Language and Culture Conflict	0.72	0.30	5.83	1.00	**0.02**	2.06
19	Pregnancy or Parenting	1.27	0.46	7.53	1.00	**0.01**	3.56
20	Gifted and /or Talented Beyond	-0.14	0.25	0.29	1.00	0.59	0.87
21	Alternative to Available Modes	-0.01	0.15	0.01	1.00	0.94	0.99
22	Laziness / Lack of Discipline	-0.38	0.07	27.31	1.00	**0.00**	0.68
24	Education Support	0.06	0.17	0.10	1.00	0.75	1.06
25	Migrant Personal Trauma	-1.22	0.77	2.52	1.00	0.11	0.30
Constant		-7.79	1.14	47.04	1.00	0.00	0.00

The results presented in Table 1 can be interpreted as follows.

In the Classification Table, the Overall Percentage of 65.5 shows that in 65.5% of the cases, the Risk of Disengagement was correctly predicted by the model.

The Wald Chi-Square test results support rejection of the null hypothesis that the constant was 0 because the p-value of 0.000 was smaller than the critical p-value of 0.05. In the Model Summary, the Log likelihood value of 5078.77 shows high probability that the observed values of Risk of Disengagement were predicted from the observed values of the independent variables. The values for the Cox and Snell coefficient (0.283) and the Nagelkerke coefficient (0.390) were consistent with this finding.

For the Variables in the Equation sub-table, positive values for B show the increase in the predicted log odds of Risk of Disengagement that would be predicted by an increase in an independent variable provided all other independent variables are held constant. For example the log odds of Risk of Disengagement increased as the independent variable Alienation and Disengagement increased (B = 6.14). Alternatively, the log odds of Risk of Disengagement decreased as the independent variable Experiencing Personal Abuse increased (B = -0.41). The Wald Chi-Square test indicates whether or not such increases or decreases are due to chance. For example, the Logit Coefficient for the independent variable Alienation and Disengagement was statistically significant ($p < 0.01$) whereas the Logit Coefficient for the independent variable Experiencing Personal Abuse was not statistically significant ($p > 0.05$). For six independent variables, B was positive and statistically significant as shown by bold type significance levels in the sub-table ($p < 0.05$). These were Alienation and Disengagement; Low Attendance Rates; Substance Abuse; Criminality; Migrant: Language and Culture Conflict; and Pregnancy or Parenting. In contrast, B was negative and statistically significant for Laziness /Lack of Discipline.

The Output Odds Ratio, Exp(B) (the exponentiation of the Logit Coefficient), shows the odds that the dependent variable will change for every one unit change in the independent variable. For example, for every one unit increase in Alienation and Disengagement, the odds of Risk of Disengagement (vs. non-disengagement) increased by a factor of 464.00 and for every one unit increase in Low Attendance Rates, the odds of Risk of Disengagement (vs. no Risk of Disengagement) increased by a factor of 1.72.

These results provide confirmation of Hypothesis One - Students identified at risk of *not* being engaged in further education, employment or training were more likely to be characterised by current conditions than those students not identified at risk. The predictor conditions with positive Logit Coefficients were in rank order of strength: Alienation and Disengagement (Exp[B] = 464.00); Pregnancy or Parenting (Exp[B] = 3.56); Migrant: Language and Culture Conflict (Exp[B] = 2.06); Criminality (Exp[B] = 1.95); Low Attendance Rates (Exp[B] = 1.72); and Substance Abuse (Exp[B] = 1.65). Laziness /Lack of Discipline was also a predictor (Exp[B] = 0.68), but the Logit Coefficient was negative.

Table 2

Binary regression analysis: Dependent variable Item 23 - Severe risk of disengagement

Classification Table(a,b)

	Observed		Predicted			
			Item 23	Percentage Correct		
			0	1		
Step 0	VAR00023	0	4834	0	100.	
		1	929	0	0	
	Overall Percentage					82.51
a	Constant is included in the model.					
b	The cut value is .500					

Wald Chi-Square test

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.55	0.04	1845.48	1.00	0.000	0.21

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	3839.8	0.184	0.306

Variables in the Equation

Item	Condition	B	S.E.	Wald	df	Sig.	Exp(B)
1	Alienation and Disengagement	4.54	0.30	236.02	1.00	**0.00**	93.43
3	Low Attendance Rates	-0.90	0.09	108.54	1.00	**0.00**	0.41
4	Substance Abuse	-0.51	0.13	16.38	1.00	**0.00**	0.60
5	Experiencing Personal Abuse	0.28	0.25	1.23	1.00	0.27	1.32
6	Family Relationship Breakdown	-0.43	0.10	19.99	1.00	**0.00**	0.65
7	Personal Relationship Problems	0.04	0.13	0.09	1.00	0.77	1.04
8	Group Relationship Problems	-0.24	0.13	3.45	1.00	0.06	0.79
9	Risk or History of Self Harm	-0.10	0.20	0.27	1.00	0.60	0.90
10	School: Individual Relationship Breakdown	-0.55	0.11	26.79	1.00	**0.00**	0.58
11	Poor Literacy and Numeracy Skills	-0.19	0.09	4.06	1.00	**0.04**	0.83
12	Criminality	-0.49	0.15	10.83	1.00	**0.00**	0.61
13	Personal Psychological Problems	-0.21	0.12	3.07	1.00	0.08	0.81
14	Learning Difficulties	0.13	0.13	1.03	1.00	0.31	1.14
15	Mental Illness	-0.13	0.23	0.31	1.00	0.58	0.88
16	Physical Disability	0.33	0.31	1.11	1.00	0.29	1.39
17	Environmental Rejection	-0.64	0.14	22.15	1.00	**0.00**	0.53
18	Migrant: Language and Culture Conflict	-0.50	0.33	2.21	1.00	0.14	0.61
19	Pregnancy or Parenting	-2.08	0.36	32.67	1.00	**0.00**	0.13
20	Gifted and /or Talented Beyond	0.21	0.30	0.49	1.00	0.49	1.23
21	Alternative to Available Modes	0.54	0.19	7.94	1.00	**0.00**	1.71
22	Laziness / Lack of Discipline	-0.40	0.09	21.43	1.00	**0.00**	0.67
24	Education Support	-0.40	0.21	3.72	1.00	0.05	0.67
25	Migrant Personal Trauma	1.65	1.12	2.19	1.00	0.14	5.23
Constant		-2.30	1.28	3.25	1.00	0.07	0.10

The results presented in Table 2 can be interpreted in the same way as the interpretation of the results in Table 1. The conditions that predicted Severe Risk of Disengagement (the predictor conditions with positive Logit Coefficients) were in rank order of strength: Alienation and Disengagement (Exp[B] = 93.43); and

Alternative to Available Modes (Exp[B] = 1.71). The predictor conditions of Severe Risk of Disengagement with negative Logit Coefficients were in rank order of strength: Alternative to Available Modes (Exp[B] = 1.71; Laziness /Lack of Discipline (Exp[B] = 0.67; Family Relationship Breakdown (Exp[B] = 0.65; Criminality (Exp[B] = 0.61; Substance Abuse (Exp[B] = 0.60; School: Individual Relationship Breakdown (Exp[B] = 0.58; Environmental Rejection (Exp[B] = 0.53; Low Attendance Rates (Exp[B] = 0.41; and Pregnancy or Parenting (Exp[B] = 0.13.

These results provide partial confirmation of Hypothesis Two - Students identified at severe risk of *not* being engaged in further education, employment or training are more likely to be characterised by current conditions than those students not identified at severe risk.

However, nine of the eleven statistically significant predictor conditions were inversely related to severe risk (negative Logit Coefficients). In contrast to the 1831 students identified at risk of disengagement who were characterised by six conditions with a positive relation to risk, the 929 students identified at severe risk of disengagement were characterised by only two conditions. Of these latter two conditions, Alienation and Disengagement was a 'positive' predictor of both risk and severe risk whereas Alternative to Available Modes was a 'positive' predictor of only severe risk. This finding and the preceding findings are discussed in the following section of the report.

Discussion and implications

Students who were assessed as currently alienated and disengaged were also consistently assessed as being at risk and severe risk of future disengagement. It appears that disengagement was not seen an ephemeral phenomenon in that students not in education, training or approved work were expected to remain disengaged from these activities. The strength of this factor as a predictor of risk and severe risk of disengagement was high (Exp[B] 464.00 and 93.43 respectively). Presumably, if students not currently in education, training or approved work are able to participate in these activities, then the risk of future disengagement may well be reduced. However, testing this assumption would require further research such as a longitudinal study or an experimental design investigation.

The six conditions that increased as the risk of disengagement increased (B positive, $p < 0.05$) could be viewed as indicators of future disengagement. The odds of an increase in disengagement (vs. non-disengagement) increased by a factor of at leat 1.0 for increases in the six conditions (Exp[B] ranged from 1.65 to 464.00). From a diagnostic perspective, current Alienation and Disengagement, Pregnancy or Parenting, Migrant: Language and Culture Conflict, Criminality, Low Attendance Rates, or Substance Abuse can all predict which students will be identified at risk of future disengagement. While ameliorating these conditions through intervention programs might be expected to reduce the level of risk, cause and effect relations cannot be assumed. Notwithstanding, early identification of students displaying these conditions could be useful for selecting students to participate in intervention programs on the assumption they will probably be at risk in the future. The negative Logit Coefficient for Laziness /Lack of Discipline (-0.38) suggests that caution should be exercised in interpreting this condition as an indicator of disengagement risk. This

is because a decrease in the condition was shown to be associated with a statistically significant ($p < 0.05$) increase in risk of disengagement (Exp[B] = 0.68).

The small number of conditions (two),that were shown to predict severe risk of disengagement with a positive relation was unexpected in light of the larger number of predictors identified for risk of disengagement (six with positive relations). One way to interpret this finding is not to consider risk as a precursor to severe risk or as a lower level condition than severe risk; instead, to see students at risk and at severe risk as different categories of students with different respective indicators. Indeed, four of the 'positive' predictors of risk were shown to predict decreases in severe risk. For example, an increase in Low Attendance Rates predicted an increase in risk ($B = 0.54$, $p < 0.05$) but a decrease in severe risk ($B = 0.90$, $p < 0.05$). As was noted previously, Alternative to Available Modes was a predictor unique to severe risk ($B = 0.54$, $p < 0.05$; Exp[B] = 1.71) since it was not revealed a predictor of risk ($B = -0.01$, $p > 0.05$). The students assessed as exhibiting this condition were characterised as 'alternative' to available modes and contexts in learning style or orientation. It appears that when the student services staff decided to classify a student as at severe risk in contrast to at risk, the decision may have been influenced pre-existing differentiation between these two categories of students. The criterion for differentiation was perceived as lack of availability of programs (modes and contexts) appropriate for the needs of the student (learning style or orientation). This is not to be confused with rejection of the school, training or work environment (Environmental Rejection) which was negatively related to severe disengagement ($B = -0.64$, $p < 0.05$).

Additionally, there are some aspects of the design of the research that require comment. First, the assessors were staff from different school districts and each assessed students from their own district. Although assessment training was provided in conjunction with a manual of survey instructions, assessor bias may have reduced inter-rater reliability. Second, the student conditions assessed were derived from literature and previous research on disengagement with schooling and selected in consultation with qualified school psychologists and social workers. While the instrument design process enhanced content validity, criterion-related validity may have been lacking as revealed by the comparatively large numbers of items that were not shown to predict either risk or severe risk of disengagement. Further, only two conditions were statistically confirmed to increase as severe risk increased. Criterion-related validity might have been improved by inclusion of more items specifically indicating severe risk. Third, the response categories were nominal and the assessors were not provided with ordinal response categories to allow them to indicate a degree of affirmation that a condition was characteristic of the student assessed. Fourth, the initial conceptualisation of risk of disengagement did not assume presence of a trait which was expected to vary in degree amongst the students assessed - risk of disengagement was considered either characteristic or not characteristic as was severe risk of disengagement. Also the items were not designed to constitute a linear scale with some conditions anticipated easy to affirm and others anticipated more difficult to affirm. For these reasons, the survey did not measure disengagement risk and was essentially a profiling tool eliciting data amenable to non-parametric analyses.

Conclusion

Notwithstanding the above limitations of the study, the findings are significant and of consequence for understanding the provision of education, training and employment for school-age youth in Western Australia.

Identification of the six conditions that predicted risk of disengagement (positive relations) - Alienation and Disengagement, Pregnancy or Parenting, Migrant: Language and Culture Conflict, Criminality, Low Attendance Rates, and Substance Abuse – has application in making decisions about the provision of support for youth at risk of disengagement. The findings of the study infer that if the number of youth presenting these conditions was reduced, the level of disengagement risk would decrease. Testing the veracity of this inference requires further research.

The predictive strength of the currently alienated and disengaged condition on both future risk and sever risk of disengagement has implications for the delivery of schooling to younger students. Manifestation of lack of participation in education, training or employment could well be a consequence of attitudinal development being influenced by earlier experiences with school programs, including work-release. While the study has not provided conclusive evidence of this supposition, the connection between current and future disengagement could be extrapolated back to antecedent influences such as a disposition towards avoiding participation. Again further research is warranted.

The students identified as ‘alternative’ in terms of available modes, contexts, learning style or orientation had a high probability of being identified at severe risk of disengagement. This finding can be interpreted in terms of perceived misfit between school program availability and the severely-at-risk student’s preferences for a particular approach towards learning and ways of learning. In the absence of conclusive evidence, it is not possible to assume provision of programs more appropriate for these students would lead to a lower level of risk. However, the finding clearly shows that the student services staff who provided the data perceived presence of the mismatch and that programs appropriate for this particular cohort of students were not provided.

Finally, the size of the sample and the sampling method in conjunction with the Binary Logistic Regression analytic technique enable generalisation of the findings and prediction.

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