



Predicting change over time in career planning and career exploration for high school students

Peter A Creed^{a,*}, Wendy Patton^b, Lee-Ann Prideaux^a

^a*School of Psychology and Service Industry Research Centre, Griffith University, Gold Coast, Australia*

^b*School of Learning and Professional Studies, Queensland University of Technology, Brisbane, Australia*

Abstract

This study assessed 166 high school students in Grade 8 and again in Grade 10. Four models were tested: (a) whether the T1 predictor variables (career knowledge, indecision, decision-making self-efficacy, self-esteem, demographics) predicted the outcome variable (career planning/exploration) at T1; (b) whether the T1 predictor variables predicted the outcome variable at T2; (c) whether the T1 predictor variables predicted change in the outcome variable from T1–T2; and (d) whether changes in the predictor variables from T1–T2 predicted change in the outcome variable from T1–T2. Strong associations ($R^2 = 34\%$) were identified for the T1 analysis (confidence, ability and paid work experience were positively associated with career planning/exploration). T1 variables were less useful predictors of career planning/exploration at T2 ($R^2 = 9\%$; having more confidence at T1 was associated with more career planning/exploration at T2) and change in career planning/exploration from T1–T2 ($R^2 = 11\%$; less confidence and no work experience were associated with change in career planning/exploration from T1–T2). When testing effect of changes in predictor variables predicting changes in outcome variable ($R^2 = 22\%$), three important predictors, indecision, work experience and confidence, were identified. Overall, results indicated important roles for self-efficacy and early work experiences in current and future career planning/exploration of high school students.

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*Corresponding author. Tel.: +61 7 5552 8810.

E-mail address: p.creed@griffith.edu.au (P.A. Creed).

Introduction

Career maturity, defined as an individual's readiness and capacity to deal with the age related tasks associated with making a career decision (Super, 1990), is central to a developmental understanding of career behaviour, and is one of the most widely researched aspects in the careers domain (Powell & Luzzo, 1998). Two basic components of career maturity, namely attitude/behaviour and knowledge, have been widely acknowledged and examined (Crites, 1978; Crites & Savickas, 1995). Attitude/behaviour refers to the beliefs and behaviours associated with making a career decision, and has been operationalized, for example, as career-related orientation, involvement, planning and exploration. Career knowledge relates to the information and skills required to make the decision, such as self-appraisal, occupational information, goal selection, planning and problem solving (Crites & Savickas, 1995; Pinkney & Bozik, 1994).

A number of correlates of career maturity has been identified (for recent reviews see Patton & Lohan, 2001; Prideaux & Creed, 2001). These correlates include biographic variables, such as age, gender, socioeconomic status and ability. As expected with a developmental construct, studies typically report that older students score higher on career maturity scores than younger students. This result has been shown cross-nationally and using a range of measures (Fouad, 1988, Patton & Creed, 2001, Wallace-Brosious, Serafica, & Osipow, 1994). The majority of studies also shows that females have higher career maturity scores than males (Patton & Creed, 2001; Rojewski, Wicklein, & Schell, 1995). Small positive effects have been found for socioeconomic status, although these associations have been stronger with the knowledge rather than the attitudinal/behavioural components of career maturity (Neville & Super, 1988; Super & Neville, 1984). More recent studies have also suggested that socioeconomic status may be mediated by other variables, such as work salience (Naidoo, Bowman, & Gerstein, 1998). Small positive effects have also been found for ability, typically operationalized as school achievement, on career maturity, again with stronger associations between knowledge and ability rather than attitude/behaviour and ability (Creed & Patton, 2003a; Luzzo, 1993).

A range of person and career-related variables has also been associated with career maturity, including career decision status, the individual's experience of the world of work, career self-efficacy and self-esteem. Career decision status, or how decided or certain an individual is about a career, has been found to be associated with career maturity (Brusoki, Golin, Gallagher, & Moore, 1993; Rojewski, 1994), with individuals more certain or decided about a career path being more career mature. Similarly, having paid work experience outside of the school is associated with career maturity (Creed & Patton, 2003b), especially so when the employment is congruent with the individual's career interests (Luzzo, McWhirter, & Hutcheson, 1997), although it has been suggested that the relationship between work experience and career maturity may not be linear, with detrimental effects occurring when overly long hours are worked (Barling, Rogers, & Kelloway, 1995; Steinberg & Dornbusch, 1991).

Career self-efficacy also has positive correlates with a range of career maturity variables, including career attitude (Anderson & Brown, 1997; Creed, Patton, & Bartrum, 2004), career exploration (Brown, Darden, Shelton, & Dipoto, 1999) and career decidedness (Creed et al., 2004). Career self-efficacy is an important motivational variable as it influences the focus, initiation and persistence of behaviours, including career behaviours (Bandura, 1986; Lent, Brown, & Hackett, 1994). Along with self-efficacy, self-esteem variables have also been associated

with career maturity. Creed et al. (2004) found more career exploration and planning in students with higher self-esteem, and Wallace-Brosious, Serafica, and Osipow (1994) related career development to the development of the self-concept generally. Finally, the two components of career maturity, of attitude/behaviour and knowledge, have also typically been found to be related (Creed & Patton, 2003a), with students having a career focus and engaging in career decision related behaviour also reporting more knowledge and skills associated with the decision-making process.

Thus, as recent empirical literature suggests, career maturity is associated with being older, being female, having a higher socio-economic background, being more able, having work experience, being more certain about your career path, and having more confidence and esteem. These correlates are embedded in the processes by which young people move from random and serendipitous world-of-work and self-exploration to a more focused exploration that characterizes career maturity (Vondracek, 1993). A criticism of research in this area, however, is that the studies have mainly involved correlational designs and used university or college students (Prideaux & Creed, 2001). Cross-sectional designs allow researchers to describe variables and identify patterns of relationships at a particular point in time. However, longitudinal methodologies are required to describe and investigate dynamic changes in individuals (Menard, 2002). Apart from providing reliable estimates of change and predictors of change over time, and allowing stronger statements to be made regarding causality, longitudinal designs also provide information on developmental trajectories, risk and asset factors and developmental concomitants (Taris, 2000).

The present study examined changes in career maturity across time (using a time lag of two years, which was presumed to be sufficiently long to allow for developmental changes in career maturity), and tested the role of a range of biographic (age, gender, socio-economic status, ability), person (self-esteem) and career variables (career decision status, career decision-making self-efficacy, paid work experience) in changes in career maturity. Early adolescence has been shown to be a time of active vocational development, when young people contemplate educational and career paths, obtain part-time work, select school subjects and made decisions about a future career (Hartung, Porfeli, & Vondracek, 2005). Thus, we followed early adolescents from their first year of high school (Grade 8 in Australia) to their third year (Grade 10), when it was expected that career maturity levels would be volatile. The main research question tested related to the changes in career maturity over time, that is, what are the important predictors that influence changes in career maturity over time? To answer this main question, four research questions were tested, including what are the same-time (i.e., cross-sectional) variables that predict career maturity, what are the T1 variables that predict T2 career maturity, what are the T1 variables that predict changes in career maturity from T1–T2, and finally, what changes in person and career-related variables from T1–T2 predict changes in career maturity from T1–T2?

Method

Participants

At T1, participants were 220 Year 8 students, comprising 113 (51%) females and 107 (49%) males. Ages ranged from 13.13 to 15.39 years ($M = 14.10$, $S.D. = .45$). On a six-point self-report

measure of school achievement (of LA, LA+, SA, SA+, HA and VHA, where LA = low achievement, SA = satisfactory, HA = high achievement and VHA = very high achievement) 12 (6%) indicated they typically achieved LA, 58 (26%) achieved LA+, 50 (23%) achieved SA, 57 (26%) achieved SA+, 30 (14%) achieved HA, and 13 (6%) achieved VHA. Sixty-three students (29%) reported current or previous paid part-time work experience outside of the school (adolescents can legally work in Australia in their 14th year). Three levels of socioeconomic status (SES) were calculated based on parental education (Anderson & Vervoorn, 1983, p.172). On this scale, 98 (45%) of parents had up to 10 years of education, 97 (44%) completed 12 years, and 25 (11%) had a tertiary education.

At T2, participants were 166 Grade 10 students who had completed the survey at T1 when they were in Grade 8 (retention rate = 75%). There were 88 males (53%) and 78 females (47%), whose ages ranged from 15.13 to 17.36 ($M = 16.06$, $S.D. = .44$). On the six-point self-report measure of school achievement, 8 students (5%) indicated they typically achieved LA, 44 (27%) achieved LA+, 49 (30%) achieved SA, 37 (22%) achieved SA+, 24 (15%) achieved HA, and 4 (2%) achieved VHA. Ninety-three students (56%) reported current or previous paid part-time work outside of the school. On the three SES levels, based on T1 reports, 73 (44%) of parents had up to 10 years of education, 74 (45%) completed 12 years, and 19 (11%) had a tertiary education.

Materials

At T1 and T2, all students completed scales tapping career maturity (career exploration/planning and career knowledge), career decidedness, career decision-making self-efficacy and self-esteem.

Scales at T1

Career Maturity Attitude and Competency

The 72-item Australian version of the Career Development Inventory (CDI-A; Lokan, 1984) measures several aspects of career maturity, including career exploration and planning, awareness and use of resources, knowledge of the career development process, knowledge of the world of work, and knowledge and use of decision-making principles. Two composite scales can be calculated for the CDI-A, and are used in this study. These are Career Development Attitude (calculated by summing the 20-item attitudinal subscale of Career Planning and the 16-item attitudinal subscale of Career Exploration) and Career Development Knowledge (calculated by summing the 24-item knowledge subscale of World of Work Information and the 12-item knowledge subscale of Career Decision Making). For both composites, higher scores indicate higher levels of that construct. Satisfactory reliability and validity data are reported in the manual (Lokan), which represent similar psychometric properties to those reported for the American inventory (Pinkney & Bozik, 1994). The internal reliability coefficients for this sample were .89 for Career Development Attitude and .78 for Career Development Knowledge.

Career Decision Status

The Career Indecision subscale of the Career Decision Scale (Osipow, 1987) contains 16 items and provides a measure of student's level of career indecision. In this study, higher scores indicate

more indecision. Internal reliability coefficients have been consistently reported in the .80 range (Hartman, Fuqua, & Hartman, 1983). The internal reliability co-efficient for this sample was .87 (.89 at T2).

Career Decision-making Self-efficacy

The 25-item short version of the Career Decision-making Self-efficacy scale (Betz, Klein, & Taylor, 1996) measures confidence regarding ability to make career-oriented decisions. Higher scores indicate more career-related self-efficacy. Betz et al. reported adequate reliability and validity for the scale. The internal reliability for the present sample was .95 (.94 at T2).

Self-esteem

The 10-item Rosenberg Self-esteem Scale (Rosenberg, 1965) measures the stable dimension of global self-worth. It is the most widely used instrument for the measure of this construct (Blascovich & Tomaka, 1991). Higher scores indicate more self-esteem. The internal reliability coefficient for this sample was .84.

Scales at T2

The Career Decision Scale and Career Decision-Making Self-efficacy Scale, which were administered at T1, were also administered at T2. The other T2 scales were:

Career Maturity Attitude and Competency

The Career Maturity Inventory-Revised (CMI-R; Crites & Savickas, 1995) consists of two 25-item subscales that measure attitudes towards (Career Maturity Attitude), and competencies in (Career Maturity Competence), career decision-making. In the present study, shortened versions of the two scales were constructed based on removing items that had negative corrected item-total correlations. This procedure resulted in an 18-item Career Maturity Attitude scale with an internal reliability coefficient of .70, and an 18-item Career Maturity Competence scale with an internal reliability co-efficient of .52. Numerous studies have attested to the psychometric properties of this scale (Levinson, Ohler, Caswell, & Kiewra, 1998). Higher scores indicate more maturity.

Self-esteem

The 6-item Self-esteem subscale from the Flinders Adolescent Decision-making Questionnaire (Mann, 1988) measures global pre-decisional personal strengths. In the present study, a shortened version of the scale was constructed, based on removing items that had negative or near-zero corrected item-total correlations, resulting in a 3-item scale, with an internal reliability coefficient of .76. Higher scores indicate higher levels of self-esteem.

Procedure

T1 data were collected as part of a larger-scale study when students across Grades 8–12 were surveyed (see Patton & Creed, 2001). The students in the present study were in Grade 8 at T1. T2 data were collected 2 years later when the T1 students were in Grade 10. The T2 students were

tracked as part of a longitudinal study into career development. The time lag of 2 years between the two data collection points was expected to allow sufficient time for changes to occur in the students' career lives. While the participating school did not offer a formal career education component, the students would have received career information while participating in the school's normal education curricula, would have had the opportunity to attend career-related activities offered by the school (e.g., careers' evenings), and would have been exposed to career-material in the day-to-day lives (e.g., reading newspaper, discussions with parents and peers).

At both times, teachers administered the surveys in class time, and in the students' homerooms. As 54 students were not available to complete the T2 survey, this meant that there were 166 students who completed both T1 and T2 surveys. We had little information on the students who dropped out of the study. A small number was absent from the school on the day the T2 surveys were administered, but mostly T2 students were missing as they had left the school, either to transfer to another school or to join the labour market.

The design was a two-wave longitudinal panel design that used the same predictor and outcome variables at T1 and T2. Four models were tested using hierarchical regression analyses. These were: (a) do the T1 predictor variables (Career Development Knowledge, Career Indecision, Career Decision-making Self-efficacy, Self-esteem and demographic variables) predict the T1 career planning/exploration outcome variable (Career Development Attitude); (b) do the T1 predictor variables predict the T2 career planning/exploration outcome variable (Career Maturity Attitude); (c) do the T1 predictor variables predict changes in the career planning/exploration outcome variable from T1–T2; and (d) do changes in the predictor variables from T1–T2 predict changes in the career planning/exploration outcome variable from T1–T2. Difference (or raw change) scores, calculated by subtracting T1 variable scores from T2 variable scores, were created to test the change in time hypotheses. [Taris \(2000\)](#) indicated that similar results are obtained from this approach and the regressor variable approach (in which baseline variables are not subtracted from T2 variables but are included in their own right), but recommended the use of difference scores as this approach was more intuitive. As different scales were used at T1 and T2 for Career Maturity Attitude (CDI-A subscale of Career Development Attitude at T1; CMI-R subscale of Career Maturity Attitude at T2), Career Maturity Competency (CDI-A subscale of Career Development Knowledge at T1; CMI-R subscale of Career Maturity Competency at T2) and Self-esteem (Rosenberg Self-esteem Scale at T1; Self-esteem subscale from the Flinders Adolescent Decision-making Questionnaire at T2) difference scores were calculated following scores on these scales being standardised.

Model (a) is a cross-sectional analysis, with the independent variables predicting the outcome variable at the same point in time. Model (b) is similar to a cross-sectional analysis except that the dependent variable is collected at a later point in time, and tests whether the independent variables at T1 predict the outcome variable at T2. Model (c) allows for the inclusion of baseline effects for the outcome measure. This allows the effect of the predictor variables to be assessed independent of pre-existing levels of career planning/exploration levels, and tests whether the independent variables at T1 predict changes in the outcome variable from T1–T2. Model (d) controls for initial levels of both predictor and outcome variables, and tests whether changes in the predictor variables from T1–T2 predicts changes in the outcome variables from T1–T2.

Results

Attrition analysis

As there were 220 students who completed T1 surveys and only 166 students who completed surveys at both T1 and T2, we tested whether the 54 students who dropped out of the study (i.e. did not complete the T2 survey) differed from those who stayed in the study, on all T1 variables. Chi-square and independent sample *t*-tests showed that the dropouts did not differ from stayers on any of the variables being tested (Career Development Attitude, Career Development Knowledge, Career Indecision, Career Decision-making Self-efficacy, Work Experience, Self-esteem) or on the demographic variables (Age, Gender, SES, School Achievement). Table 1 reports summary data for the two samples at T1 and the T2 sample.

T1 variables predicting career planning/exploration at T1

A hierarchical multiple regression analysis was used to test the effect of the T1 predictor variables on T1 career planning/exploration (operationalized as Career Development Attitude). The T1 demographic variables of School Achievement and Work Experience at T1 had significant bivariate associations with the T1 outcome variable, and were entered as control variables at Step 1 (see Table 2 for correlations). The T1 predictor variables of Career Indecision, Career Decision-making Self-efficacy and Self-esteem were also significantly correlated with the T1 outcome variable and were entered at Step 2. The T1 variable of Career Development Attitude was entered as the outcome variable. Summary data for this analysis are reported in Table 3.

The two control variables entered at Step 1 accounted for a significant 12.0% of the variance of career planning/exploration, $F(2, 217) = 15.31, p < .001$. Significant individual predictors at this Step were, in order of importance, School Achievement ($\beta = .29, p < .001, sr^2 = 8.47\%$) and Work Experience at T1 ($\beta = .25, p < .001, sr^2 = 6.50\%$), with students with higher levels of achievement and work experience reporting more career planning/exploration. At Step 2, the addition of the career variables and self-esteem accounted for a further significant 21.7% of the variance, $F(3, 214) = 23.50, p < .001$. Significant individual predictors at this Step were Career Decision-making Self-efficacy ($\beta = .50, p < .001, sr^2 = 20.88\%$), Work Experience at T1 ($\beta = .19, p = .001, sr^2 = 5.15\%$), and School Achievement ($\beta = .16, p = .008, sr^2 = 3.20\%$), with students with more

Table 1
Summary data

Variables	T1 (<i>N</i> = 220)		T1 (<i>N</i> = 166)		T2 (<i>N</i> = 166)	
	<i>M</i>	S.D.	<i>M</i>	S.D.	<i>M</i>	S.D.
Career Development/Maturity Attitude	92.40	18.23	92.83	18.30	12.06	3.18
Career Development/Maturity Competency	19.12	5.67	19.61	5.58	13.03	2.49
Career Indecision	32.70	9.13	32.04	8.63	32.63	9.90
Career Decision-making Self-efficacy	85.49	18.14	86.75	17.57	88.81	16.16
Self-esteem	20.92	5.17	20.71	5.24	5.27	1.97

Table 2
Bivariate correlations ($N = 220$ for T1 correlations; $N = 166$ for T2)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Career Maturity Attitude T1	—	.07	-.24***	.54***	-.23**	.15	-.04	-.10	.39***	.29***	-.63***	-.13	.11	-.22**	.34***	-.10	.06	.01	.25***	.21**	.19**
2. Career Maturity Competency T1	—	-.43***	.30***	-.22**	.14	.24**	-.15	-.04	-.04	.01	-.60***	.19*	-.34***	.10	-.09	-.36***	-.02	.41***	-.21**	-.09	
3. Career Indecision T1	—	—	-.43***	.33***	-.22**	-.04	.40***	-.20**	-.11	.01	.28***	-.46***	.15	-.26**	-.01	.14*	.07	-.26***	.04	-.02	
4. Decision-making Self-efficacy T1	—	—	—	-.46***	.26**	.18*	-.18*	.43***	.33***	-.24**	-.10	.11	-.59***	.50***	-.10	-.02	.06	.26***	.08	.11	
5. Self-esteem T1	—	—	—	—	—	-.19*	-.03	.14	-.24**	-.20*	.03	.13	-.11	.21**	-.77***	.08	-.03	-.01	-.26***	-.03	-.06
6. Career Maturity Attitude T2	—	—	—	—	—	—	-.13	-.52***	.35***	.33***	.68***	-.22**	-.32***	.07	.34***	.09	.12	-.03	.07	-.06	.01
7. Career Maturity Competency T2	—	—	—	—	—	—	—	.13	.02	.02	-.08	.64***	.17*	-.15	-.03	-.04	-.10	-.03	-.19*	-.13	-.09
8. Career Indecision T2	—	—	—	—	—	—	—	—	-.33***	-.20*	-.34***	.23**	.63***	-.12	-.22**	-.04	-.05	.04	-.06	-.05	.00
9. Decision-making Self-efficacy T2	—	—	—	—	—	—	—	—	—	.64***	-.02	.05	-.15	.48***	.56***	.02	.14	.05	.09	.10	.17*
10. Self-esteem T2	—	—	—	—	—	—	—	—	—	—	.05	.05	-.10	.25***	.77***	.06	.17*	.07	.04	.05	.18*
11. Career Maturity Attitude T1–T2 Difference Score	—	—	—	—	—	—	—	—	—	—	—	-.07	-.34***	.22**	.01	.16*	.10	-.01	-.14	-.21**	-.14
12. Career Maturity Competency T1–T2 Difference Score	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13. Career Indecision T1–T2 Difference Score	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14. Decision-making Self-efficacy T1–T2 Difference Score	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15. Self-esteem T1–T2 Difference Score	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16. Age	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17. Gender	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18. SES	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19. School Achievement	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20. Work Experience at T1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21. Work Experience at T2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Table 3
Summary data for hierarchical regression analysis predicting career planning/exploration at T1; *N* = 220

Variable	Step 1			Step 2		
	<i>B</i>	SEB	<i>B</i>	<i>B</i>	SEB	β
School Achievement	4.00	.90	.29***	2.22	.83	.16**
Work Experience at T1	10.04	2.59	.25***	7.78	2.28	.19**
Career Indecision				−.01	.13	−.00
Career Decision-making Self-efficacy				.51	.07	.50***
Self-esteem				.18	.23	.05
ΔR^2						.22***
Total R^2			.12***			.34***

Note: * = *p* < .05, ** = *p* < .01, *** = *p* < .001.

Table 4
Summary data for standard regression analysis predicting T2 career planning/exploration using T1 predictor variables; *N* = 166

Variable	<i>B</i>	SEB	β
Career Indecision	−.05	.03	−.14
Career Decision-making Self-efficacy	.03	.02	.17*
Self-esteem	−.05	.05	−.08
Total R^2			.09**

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

confidence, higher levels of achievement and work experience reporting more career planning/exploration.

T1 variables predicting career planning/exploration at T2

A standard multiple regression was used to test the effect of the T1 predictor variables on T2 career planning/exploration. No demographic variables were significantly associated with the T2 outcome variable, and thus none was included in the analysis. The T1 variables of Career Indecision, Career Decision-making Self-efficacy and Self-esteem were entered as predictor variables. The T2 variable of Career Maturity Attitude was entered as the outcome variable. Summary data for this analysis are reported in Table 4. The T1 predictor variables accounted for a significant 9% of the variance of T2 career planning/exploration, $F(3, 162) = 5.37, p = .002$. The only significant individual T1 predictor was Career Decision-making Self-efficacy ($\beta = .17, p = .044, sr^2 = 2.46\%$), with more confident students at T1 reporting more career planning/exploration at T2.

T1 variables predicting changes in career planning/exploration from T1 to T2

A hierarchical multiple regression analysis was used to test the effect of the T1 predictor variables on changes in career planning/exploration from T1 to T2 (calculated as T1–T2 difference scores). The T1 demographic variables of Age and Work Experience at T1 were significantly associated with the T1–T2 outcome variable, and were entered at Step 1. The T1 predictor of Career Decision-making Self-efficacy was significantly correlated with the T1–T2 outcome variable and was entered at Step 2. The T1–T2 difference score for Career Development Attitude/Career Maturity Attitude was entered as the career planning/exploration outcome variable. Summary data for this analysis are reported in Table 5.

The two T1 control variables entered at Step 1 accounted for a significant 6.5% of the variance in T1–T2 changes in career planning/exploration, $F(2, 163) = 5.69, p = .004$. Work Experience at T1 ($\beta = -.20, p = .009, sr^2 = 4.16\%$) was a significant individual predictor, with having no work experience being associated with a change in career planning/exploration from T1 to T2. At Step 2, the addition of the T1 career variable accounted for a further significant 4.8% of the variance, $F(1, 162) = 8.84, p = .003$. Significant individual predictors at this Step were Career Decision-Making Self-efficacy ($\beta = -.22, p = .003, sr^2 = 5.15\%$) and Work Experience at T1 ($\beta = -.21, p = .006, sr^2 = 4.58\%$), with students without work experience and having lower levels of confidence reporting a change in career planning/exploration from T1–T2.

Changes in predictor variables from T1–T2 predicting changes in career planning/exploration from T1–T2

A hierarchical multiple regression analysis was used to test the effect of changes in the predictor variables from T1–T2 on changes in career planning/exploration from T1 to T2. The T1 demographic variables of Age and Work Experience at T1 were significantly associated with the T1–T2 outcome variable, and were entered at Step 1. The T1–T2 predictor variables of Career Indecision and Career Decision-making Self-efficacy were significantly correlated with the T1–T2 outcome variable and were entered at Step 2. The T1–T2 difference score for Career

Table 5

Summary data for hierarchical regression analysis predicting changes in career planning/exploration from T1–T2 using T1 predictors; $N = 166$

Variable	Step 1			Step 2		
	<i>B</i>	SEB	<i>B</i>	<i>B</i>	SEB	<i>B</i>
Age	.44	.23	.15	.33	.22	.11
Work Experience at T1	-.57	.21	-.20**	-.58	.21	-.21**
Career Decision-making Self-efficacy				-.02	.01	-.22**
ΔR^2						.05*
Total R^2			.07**			.11***

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Table 6

Summary data for hierarchical regression analysis predicting changes in career planning/exploration from T1–T2 using changes in predictors from T1–T2; $N = 166$

Variable	Step 1		Step 2			
	<i>B</i>	SEB	<i>B</i>	SEB	<i>B</i>	
Age	.44	.23	.15	.27	.21	.09
Work Experience at T1	–.57	.21	–.20**	–.78	.20	–.28***
Career Indecision T1–T2 Difference Score				–.04	.01	–.34***
Career Decision-making Self-efficacy T1–T2 Difference Score				.01	.01	.15*
ΔR^2						.15***
Total R^2			.07**			.22***

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Development Attitude/Career Maturity Attitude was entered as the career planning/exploration outcome variable. Summary data for this analysis are reported in Table 6.

The two T1 control variables entered at Step 1 accounted for a significant 6.5% of the variance in T1–T2 changes in career planning/exploration, $F(2, 163) = 5.69$, $p = .004$. Work Experience at T1 ($\beta = -.20$, $p = .009$, $sr^2 = 4.16\%$) was a significant individual predictor, with having no work experience associated with a change in career planning/exploration from T1 to T2. At Step 2, the addition of the T1–T2 career variables accounted for a further significant 15.1% of the variance, $F(2, 161) = 15.54$, $p < .001$. Significant individual predictors at this Step were Career Indecision ($\beta = -.34$, $p < .001$, $sr^2 = 11.76\%$), Work Experience at T1 ($\beta = -.28$, $p < .001$, $sr^2 = 8.58\%$) and Career Decision-making Self-efficacy ($\beta = .15$, $p = .043$, $sr^2 = 2.50\%$), with students without work experience at T1 and having changes in their level of indecision and confidence reporting a change in career planning/exploration from T1–T2.

Discussion

Consistent with research reported elsewhere (Patton & Lohan, 2001; Prideaux & Creed, 2001), when the correlates of career maturity (i.e., career planning/exploration) were tested cross-sectionally (i.e., at T1), several significant associations were identified (Career Decision-making Self-efficacy, Work Experience at T1 and School Achievement), and a substantial amount of the variance was accounted for (34%). Students with higher levels of career decision-making confidence, paid work experience and more ability reported higher career planning/exploration. School Achievement and Work Experience at T1 were stronger correlates when tested independent of the career- and person-related variables (entered at Step 1 of the hierarchical regression analysis), indicating a partial mediating role for the career-related variables, primarily Career Decision-making Self-efficacy. In the context of these significant correlates, Career Indecision and Self-esteem were not significantly associated with career planning/exploration, despite having significant bivariate correlations with the outcome variable.

In contrast to these results, the T1 variables were not good predictors of career planning/exploration 2 years later at T2, nor were they useful predictors of change in career planning/exploration from T1 to T2. When predicting career planning/exploration at T2, only 9% of the variance was accounted for by the T1 variables, and the only important T1 variable predicting career planning/exploration was Career Decision-making Self-efficacy, with more confident students at T1 reporting more career planning/exploration at T2. When testing the T1 variables' capacity to predict changes in career planning/exploration from T1–T2, only 11% of the variance was accounted for, with only two important T1 variables, of Work Experience at T1 and Career Decision-Making Self-efficacy, predicting changes in career planning/exploration. Students who had lower levels of confidence and no work experience at T1 reported a change in career planning/exploration from T1–T2. When testing the effects of changes in predictor variables from T1–T2 predicting changes in career planning/exploration from T1 to T2, a significant, and substantial, 22% of variance was accounted for, and three important predictors, Career Indecision, Work Experience at T1 and Career Decision-Making Self-efficacy, were identified. Students with increasing levels of indecision and confidence from T1–T2 and no work experience at T1 reported a change in career planning/exploration from T1–T2.

These results indicate important roles for self-efficacy and early work experiences in career planning/exploration for high school students. First, Work Experience at T1 was associated with career planning/exploration at T1 and changes in career planning/exploration from T1 to T2. Similar to previous studies (e.g., Creed & Patton, 2003b; Luzzo, McWhirter, & Hutcheson, 1997), the present study found a significant same-time association between work experience and career maturity, indicating a further beneficial link between these two variables. Other beneficial behaviours associated with work experience include the development of reliability, perseverance (Bowles & Gintis, 1976), work values, work identity and career aspirations (Krosnick & Alwin, 1989). The present study demonstrated that early work experience (i.e. at T1) was associated with future changes in career planning/exploration, or conversely, that having no early work experience was associated with stagnation in career planning/exploration. This implies that early work experience is associated with more thinking and doing in relation to careers. While some aspects of work experience for high school students have been criticised (e.g., Barling et al. (1995) reported negative outcomes associated with working more than 20 h per week while studying), one advantage seems to be that it is associated with maintaining a career focus for the individual.

Second, Career Decision-making Self-efficacy at T1 was associated with career planning/exploration at T1, career planning/exploration at T2, changes in career planning/exploration from T1 to T2, and importantly, changes in Career Decision-making Self-efficacy from T1–T2 were associated with changes in career planning/exploration from T1–T2. This points to an important role for self-efficacy in career planning/exploration. Bandura (1977) very early on demonstrated a direct link between self-efficacy attitudes and behavioural outcomes. Lent and Hackett (1987) argued that there was empirical support for applying self-efficacy theory to career development, and recent research has supported these claims (Lent, Brown, & Hackett, 2000). Self-efficacy has been conceptualized as the cognitive mechanism that drives behaviour and behaviour change (Bandura, 1982). It is the belief that one can perform certain behaviours to produce specific outcomes attached to those behaviours. The current study has replicated these associations for career planning/exploration, and demonstrated that self-efficacy at one point in time is related to future behaviour changes, and that changes in self-efficacy across time are related to changes in

behaviour. The implication here is that enhancing career/occupational self-efficacy in adolescents will produce changes in their career focus and behaviours later on, that is, increase career-based motivation (see Bandura, 1997).

More minor roles were identified for ability and career decision status in career planning/exploration. More able/skilful students, that is, students reporting higher school achievement, reported more career planning/exploration at T1, although ability accounted for a small proportion of the variance, and some of the effect was mediated by other career variables. Ability has previously been found to be associated with interest in careers (Lent, Brown, & Larkin, 1986), and more generally with motivational-related variables such as school engagement (Taylor, Casten, Flickinger, Roberts, & Fulmore, 1994) and need-to-achieve (Robbins, et al., 2004), which is consistent with it being related to career planning/exploration. These results may mean that less able students may require more assistance to engage in career development activities and different strategies to increase their level of career engagement.

With regards career decision status, students with increasing levels of indecision about their career direction reported engaging in increased career planning/exploration from T1–T2. Previously, career decision status has been shown to be related to career exploration intentions (Betz & Voyten, 1997). The present study indicates that changes in career indecision are associated with reported actual behaviours. This is an encouraging finding as it suggests that undecided students engage in more career planning/exploration concurrently and into the future. Lastly, consistent with previous studies (Creed et al., 2004; Wallace-Broschious et al., 1994), bivariate associations were found between self-esteem and career planning/exploration. However, when examined in the context of other career-related variables, self-esteem produced no direct effect. This implies that the effect of self-esteem, described as an affective rather than cognitive variable (Betz & Klein, 1996), is indirect (i.e., mediated) rather than direct. Smith and Betz (2002) provide some evidence for this conjecture by finding that career indecision mediated the effect of self-esteem on adolescent wellbeing.

The present study has added to the literature by identifying and comparing predictors of career maturity (operationalised as career planning/exploration) cross-sectionally and over time. A weakness of the study was the use of different scales to measure the career planning/exploration construct at the two times. Although desirable, using the same measure was not possible given practical constraints in the present study. Future research would benefit from maintaining consistency in measures across times. A further limitation was the use of a single sample of adolescents. Additional studies need to be conducted to test how the results generalize to other adolescents in other countries. The present study identified self-efficacy as a key variable in career planning/exploration when the variables were measured at the same time, and when tested across time. Other variables in the social-cognitive career model (i.e. outcome expectations, goals; Bandura, 1997; Betz et al., 1996; Lent et al., 1994) need also to be examined in this manner to determine their influence over time, and thus, their utility in applied settings.

There is a number of significant practical implications from this study's findings. The importance of work experience in career planning and exploration suggests that schools may need to commit to the inclusion of formal work experience as part of school programs. Recent international surveys (e.g., OECD, 2004) have highlighted a lack of appropriate attention to career programs in schools, a shortcoming in which Australia is included (Patton, 2005). School to work transition activities have often been included in programs for students at risk of leaving

school in an attempt to increase school engagement and facilitate a smooth post-school transfer, although these activities typically do not always include key principles of career education (Patton, 2000). It is crucial to consider career education as a key curriculum addition to adolescents' schooling, and work experience as an intentional component of all young people's adolescent experience. It may be that such experiences not only increase students' focus on their career paths, but also contribute to fostering maturity in general.

Implications for career education programs can also be drawn. The inclusion of activities to enhance adolescent career decision-making confidence, with the acknowledgement that activities need to cater for students of varying ability levels, are important messages for career education program developers. In addition, the finding that the more indecisive students engage in more career planning/exploration suggests that career development practitioners should see that many of these students are trying but that they may need to be actively encouraged and supported.

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