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Abstract

This study surveyed 166 students when they were in Grade 8 of high school, and then again when they were in Grade 10, using measures of career indecision and career decision-making self-efficacy. Consistent with social-cognitive theories we hypothesized that changes in self-efficacy over time would be causally associated with changes in career indecision over time. Using latent variable analyses, we estimated a two-wave, longitudinal cross-lagged panel design, and found that, contrary to expectations, changes in career decision-making self-efficacy did not result in changes in career indecision, despite significant contemporaneous associations at both times. Theoretical and applied implications are highlighted.

Keywords: career decision-making self-efficacy, career indecision, longitudinal, cross-lagged

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Making decisions regarding a career is an important task for young people. Consistent with developmentally focused career theories (e.g., Gottfredson, 1981; Super, 1957), this process begins to occur in primary school, when children develop their interests and begin to understand how their abilities relate to the world of work. It continues throughout the life span (Hartung, Porfeli, & Vondracek, 2005), although much more is known about career decisions made by middle and late adolescents (Savickas, 1997) and adults (Vondracek & Kawasaki, 1995), than younger adolescents and pre-adolescents. Not all young people make career decisions easily, and many experience episodes of indecision before settling on a career path (Fouad, 1994; Tinsley, 1992). Some authors estimate that as many as 50% of students experience career indecision (Gianakos, 1999), which is not surprising given the number of career and educational options available, and the need to understand how one's needs, values and goals intersect with these options. Career decisions can also have long-term repercussions, as they can commit a student to a particular career path that can involve long periods of education and training before actually resulting in employment. Thus, career indecision is an important topic in career psychology.

Career indecision can be viewed as a normal response when young people are required to make a career related decision. It might occur at any time a career is contemplated, but is especially likely to occur at career transition points, for example, when thinking about a part-time job or choosing school subjects or university programs (Patton & Creed, 2001). It has been suggested that the early years of high school are a watershed in career development, as this is when young people actively

explore their interests and aptitudes and develop career-related goals and aspirations in the context of testing their personal strengths and weaknesses against available job opportunities (Hartung et al., 2005). As such, career indecision is a developmentally appropriate experience. It may fluctuate depending on a variety of situational factors (Osipow, 1999), and is likely to resolve with the assistance of appropriate interventions, including access to appropriate career-related information and assistance with clarifying values and goals (Gordon, 1981).

Career indecision is an issue for both high school (Nota & Soresi, 2003; Patton & Creed, 2001) and college/university students (Gianakos, 1999; Lee, 2005), and has been shown to be a concern for children in their pre-teens (see Hartung et al., 2005). It is associated with a range of person variables, such as age and gender (Patton & Creed, 2001), and negatively associated with many career related variables, including career maturity (Rojewski, 1994), decision-making style (Mau, 1995), career barriers (Patton, Creed, & Watson, 2003), self-efficacy beliefs (Betz & Luzzo, 1996), identity status (Vondracek, Schulenberg, Skorikov, Gillespie, & Wahlheim, 1995), knowledge of occupations, self-knowledge (Gati & Saka, 2001), and structure of thinking about careers (Tracey & Darcey, 2002). Career indecision has also been shown to be related to a number of personal and interpersonal variables, including negative affective disposition (Multon & Lapan, 1995), fear of success (Staley, 1996), low feelings of self-esteem (Germeijs & De Boeck, 2002), poor self-awareness, anxiety (Wanberg & Muchinsky (1992), and poor social skills (Nota & Soresi, 2003).

Career indecision has also been studied widely with career decision-making self-efficacy (Betz & Voyten, 1997; Creed & Patton, 2003; Gati, Kraus, & Osipow, 1996; Taylor & Betz, 1983). Self-efficacy reflects the confidence a person has in their capacity to carry out a particular task or behaviour, and is implicated in choice,

initiation, performance and persistence at that task (Bandura, 1977, 1986). Career decision-making self-efficacy has been defined as the confidence a young person has in their capacity to carry out tasks associated with career exploration and selection (Solberg, Good, & Nord, 1994). Hackett and Betz (1981) were the first to apply Bandura's propositions about self-efficacy to career behaviour and demonstrated that career decisions, achievements and adjustment behaviours were associated with self-efficacy beliefs. Soon after, Taylor and Betz (1983) developed the Career Decision-making Self-efficacy scale to measure this construct and showed that it was associated with career indecision. Career decision-making self-efficacy has also been shown to be associated with a wide range of other career related constructs, including occupational interests (Feehan & Johnston, 1999; Lapan, Boggs, & Morrill, 1989), vocational identity (Robbins, 1985), career exploration (Blustein, 1989), career traditionality (Neville & Schlecker, 1988), career barriers (McWhirter, Rasheed, & Crothers, 2000), and career maturity (Patton & Creed, 2001).

Hackett and Betz's (1981) contribution was to extend Bandura's (1977) self-efficacy theory to vocational behaviour, hypothesizing, consistent with self-efficacy theory, that a person's task-specific level of self-efficacy would determine corresponding outcomes, such as career orientation, involvement, planning, exploration, self-appraisal and decision-making. In this conceptualization, career-decision-making self-efficacy is viewed as a causal antecedent to making a career decision, that is, a causal antecedent to being career decided or undecided. Following Bandura's (1986) development of social-cognitive theory, Lent, Brown, and Hackett (1994) proposed a social-cognitive career theory, in which self-efficacy was a direct causal antecedent to career choice goals and actions, including career decision-making, and an indirect causal antecedent to these outcomes mediated by outcome

expectations and interests. By-and-large, when self-efficacy (mainly operationalised as career decision-making self-efficacy and measured using the Career Decision-making Self-efficacy scale; Taylor & Betz, 1983) has been tested with career indecision (mainly measured using the Career Decision Scale; Osipow, 1987), self-efficacy has been presumed to be a causal antecedent to career indecision, and in the case of self-efficacy theory, an immediate proximal causal antecedent. For example, Taylor and Popma (1990) found career decision-making self-efficacy to be the only variable to make a significant contribution to the prediction of career indecision (other variables in the study were occupational saliency, occupational self-efficacy and locus of control), while Betz and Voyten (1997) identified career decision-making self-efficacy as the best predictor of career indecision (other variables in this study were academic outcome expectations and career outcome expectations).

Other conceptual frameworks also include career indecision as an outcome variable and career decision-making self-efficacy as a causal antecedent. Guay, Senécal, Gauthier, and Fernet (2003) used a self-determination theory perspective (Deci & Ryan, 1985) to test the predictors of career indecision, including career decision-making self-efficacy. Self-determination theory hypothesizes that levels of autonomy, competence and relatedness are motivational antecedents to behaviours, and that individuals who are intrinsically motivated, confident and receive support from others have, in this example, less career indecision. Guay et al. (2003) found career decision-making self-efficacy to be a significant predictor of career indecision and to act as a mediator between less proximal variables and career indecision. Further, in applied settings, for example in the development and delivery of career and vocational interventions, enhancing career decision-making self-efficacy has been seen as an important task in fostering career focus and career activities and in

reducing career indecision (Prideaux, Creed, Muller, & Patton, 2000; Prideaux, Patton, & Creed, 2002; Lent et al., 1994), and thus seen as an antecedent to career indecision.

A criticism of studies in this area generally is that they are cross-sectional in nature, and therefore cannot determine causal relationships (Prideaux & Creed, 2001). The authors could not find one study that tested the relationship between career self-efficacy and career indecision over time, and thus the temporal relationship between self-efficacy (career decision-making self-efficacy) and career indecision is not known. This is despite currently applied theories hypothesizing a causal relationship from self-efficacy to career indecision, and despite the continued assumption on the part of researchers that the causal relationship operates in this direction. This assumption is that self-efficacy is causally related to career indecision, and that changes in self-efficacy (either through maturation or intervention) will lead to a change in career indecision. More specifically, if an individual's self-efficacy is developed then their career indecision will be reduced.

An equally plausible explanation is that career indecision is causally related to self-efficacy, and that changes in career indecision will lead to changes in self-efficacy; or that reducing an individual's career indecision will create confidence to tackle career related tasks. Examining a relationship between an initial value of one variable and changes in a second variable affords stronger evidence of a causal relationship than examining a relationship between two variables at the same time (Finkel, 1995). Given the important theoretical and applied implications of determining this causal direction, the present study used a longitudinal panel design to test the temporal relationships between career decision-making self-efficacy and career indecision. Consistent with previous applications of career self-efficacy theory, social-cognitive

career theory and self-determination theory, we hypothesized that career decision-making self-efficacy was negatively related to changes over time in career indecision. As early adolescence has been implicated as a time of active vocational development (Hartung et al., 2005) we tracked young people in their first year of high school (Grade 8 in Australia) to their third year (Grade 10) when it was expected that levels of efficacy and indecision would be volatile as these young people contemplated and obtained part-time employment, selected school subjects and made decisions about a future career.

Method

Participants

At T1, participants were 223 Grade 8 students, made up of 114 (51%) females and 108 (48%) males, and one student who did not identify gender. Ages ranged from 13.13 to 15.39 years (M = 14.10, SD = .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 achievement, HA = high achievement and VHA = very high achievement), 12 students (5%) indicated they typically achieved LA, 59 (27%) achieved LA+, 50 (22%) achieved SA, 57 (26%) achieved SA+, 30 (14%) achieved HA, and 13 (6%) achieved VHA. Two students did not identify level of achievement. Sixty-four students (29%) reported current or previous paid part-time work experience outside of the school (young people can legally work in Australia in their 14th year). Ninety-nine (44%) of parents of students reported having up to 10 years of formal education, 97 (44%) reported completing 12 years, and 26 (12%) reported 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 = 74%). There were 88 males (53%) and

78 females (47%), whose ages ranged from 15.13 to 17.36 (*M* = 16.06, *SD* = .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. Based on T1 reports, 73 (44%) of parents reported up to 10 years of education, 74 (45%) completed 12 years, and 19 (11%) had a tertiary education.

Measures and Latent Variables

Career Decidedness. Career Indecision was measured using the Indecision subscale of the Career Decision Scale (CDS: Osipow, 1987). The CDS contains 19 items and consists of two subscales, the 16-item CDS Indecision subscale, which addresses various decisional problems and provides a measure of career indecision, and the 2-item CDS Certainty subscale, which indicates the degree of certainty that students feel in having made a career decision. There is also an open ended question that allows students to put their concerns in their own words. Results of the Indecision subscale are reported in this study. Sample items from the subscale are, "I know I will have to go to work eventually, but none of the careers I know about appeals to me" and "I know what educational course I'd like to do, but I don't know what careers it can lead to that would satisfy me". Students responded using a 4-point Likert-like scale, with end-points of *not at all like me* to *exactly like me*. Higher scores indicate more indecision.

Researchers have typically followed Osipow's (1980) recommendations and used the Indecision subscale as a unidimensional measure, which is consistent with Tinsley, Bowman, and York's (1989) and Stead and Watson's (1993) combined factor

analyses of several career instruments that identified the Indecision subscale as a robust independent factor. Internal consistency coefficients have been consistently reported in the .80 range (Hartman, Fuqua, & Hartman, 1983). Test-retest reliabilities have been reported in the range .61-.90 (Hartman, Utz, & Farnum, 1979). Internal reliability coefficients have been previously established for high school students in the .80 range (Patton & Creed, 2001; Watson, Foxcroft, & Stead, 1991). Concurrent validity (Hartman & Hartman, 1982), construct validity (Hartman et al., 1983) and predictive validity (Hartman, Fuqua, Blum & Hartman, 1985) have all been adequately demonstrated. The internal reliability coefficients for the present study were .86 (T1) and .89 (T2).

Career Decision-making Self-efficacy. The 25-item short form of the Career Decision-Making Self-Efficacy Scale (Betz, Klein, & Taylor, 1996) was used to measure students' efficacy beliefs about their capacity to make career-related decisions. Students were asked to indicate their level of confidence on a five-point scale, with endpoints of *no confidence at all* to *complete confidence*, to questions, such as, "How confident are you that you could decide what you value most in an occupation" and "How confident are you that you could choose a career that will fit your interests". Higher scores indicate more decision-making efficacy.

The Career Decision-making Self-efficacy scale was developed to reflect the five career choice competencies that Crites (1961) proposed as relevant for the career decision-making process (accurate self-appraisal, gathering occupational information, goal selection, making plans for the future, and problem solving). The scale is widely used as a unidimensional test and has been found to be highly reliable and to have extensive evidence for validity (Betz et al., 1996; Creed, Patten, & Watson, 2002; Watson, Brand, Stead, & Ellis, 2001). Internal reliability coefficients for the total

score are typically reported to be high in both college (e.g., Betz et al., 1996: α = .94) and high school students (e.g., Creed et al., 2002: α = .93). Test-retest reliability over a six month period has also been shown to be high, at α = .83 (Betz & Taylor, 2001). Validity evidence has been based on expected associations with a range of other career-related constructs, such as career indecision (Betz et al., 1996), career outcome expectations and exploratory intentions (Betz & Voyten, 1997). The internal reliability coefficients for the current study were .95 (T1) and .94 (T2).

Procedure

Data Collection: The present study utilized a two-wave longitudinal panel design that collected data on the same two variables at T1 and T2. T1 data were collected as part of a larger scale study when students across Grades 8-12 were surveyed (see Patton & Creed, 2001). T2 data were collected two years later when the students were in Grade 10. The time lag of two years between the two data collection points was expected to allow enough time for changes to occur in the students' career lives. The students were tracked as part of a longitudinal study into career development. At both times, teachers administered the surveys in class time, and in the students' homerooms. As 57 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.

Results

Attrition analysis

As there were 223 students who completed T1 surveys and only 166 students who completed surveys at both T1 and T2, we tested whether the 57 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 (using a Bonferroni corrected alpha level of .007; i.e., .05 ÷ 7) showed that the study dropouts did not differ from stayers on Career Indecision, $t(221) = -1.88$, $p = .061$, Career Decision-making Self-efficacy, $t(221) = 1.61$, $p = .108$, or the demographic variables of Age, $t(221) = -2.08$, $p = .04$, Gender, $\chi^2(1) = .73$, $p = .39$, Parental Education, $\chi^2(2) = 2.28$, $p = .32$, School Achievement, $\chi^2(5) = 8.42$, $p = .135$, or Work Experience, $\chi^2(1) = 3.77$, $p = .052$), indicating no selection bias for the stayers on these variables.

Gender Differences

Using a series of independent sample t-tests (with a Bonferroni corrected alpha level of $p < .0125$; i.e., .05 ÷ 4), no gender differences were found between male and female students on the measures of Career Indecision at T1, $t(220) = 2.13$, $p = .04$, or T2, $t(164) = -.67$, $p = .502$, or Career Decision-making Self-efficacy at T1, $t(220) = -.36$, $p = .721$, or T2, $t(164) = 1.87$, $p = .064$. As a result of these tests, we conducted all further analyses using the combined sample of male and female students.

Mean differences from T1-T2

Two repeated measures t-tests (with a Bonferroni corrected alpha level of $p < .025$; i.e., .05 ÷ 2) were conducted to determine if there were across time mean differences on Career Indecision and Career Decision-making Self-efficacy. These analysis

identified no mean differences between T1 and T2 for Career Indecision, $t(165) = -.74$, $p = .458$, or Career Decision-making Self-efficacy, $t(165) = -1.47$, $p = .143$. Table 1 reports summary data for the two samples at T1 and T2; Table 2 reports bivariate correlations.

Table 1

Summary data for Career Indecision and Career Decision-making Self-efficacy for the two samples at T1 and the one sample at T2

Variables	T1 (*N* = 223)		T1 (*N* = 166)		T2 (*N* = 166)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Career Indecision	7.61	3.01	7.43	2.91	7.41	2.94
Career Decision-making Self-efficacy	13.26	3.55	13.48	3.35	13.81	3.00

Table 2

Bivariate correlations between Career Indecision and Career Decision-making Self-efficacy at T1 and T2 (N = 166)

Variables	1	2	3	4
1. Career Indecision (T1)	-	.40***	-.34***	-.20**
2. Career Indecision (T2)		-	-.18*	-.33***
3. Career Decision-making Self-efficacy (T1)			-	.43***
4. Career Decision-making Self-efficacy (T2)				-

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

Data Management for Model Testing

Bentler and Chou (1987) recommended a ratio of between 5:1 and 10:1 for participants to number of parameters estimated in a latent variable analysis. As including all 16 items from the Indecision subscale and the 25 items from the Career Decision-making Self-efficacy scale in the one analysis would have violated this

assumption, we followed the recommendations of Landis, Beal, and Tesluck (2000) and created multi-item composites or item parcels for both scales at the two times. Multi-item parcels also have the benefit of producing more stable parameter estimates, compared to testing totally disaggregated latent models that evaluate the performance of every item in a scale (Landis et al.). Creating multi-item parcels is appropriate for these scales as both the Indecision subscale (see Osipow, 1980) and the Career Decision-making Self-efficacy Scale (see, for example, Betz et al., 1996) have been shown to be unidimensional measures of their respective constructs.

The goal was to create two multi-item parcels to represent each scale at T1 and T2 (i.e., two parcels for each scale at T1 and two parcels for each scale at T2). For example, the procedure for the 16-item Indecision subscale was to subject the 16 items measured at T1 to an exploratory factor analysis, in which a single-factor solution was specified. Then, guided by the factor loadings from the factor analysis, we paired the individual item with the highest factor loading with the individual item with the lowest factor loading and allocated these two items to the first composite. We then paired the item with the second highest factor loading with the item with the second lowest factor loading and allocated these two items to the second composite. The item with the third highest factor loading was paired with the item with the third lowest factor loading and allocated to the first composite, and so on, alternatively, until all items were exhausted. The two composites were formed by summing the items allocated to them. These two multi-item composites had the effect of collapsing the 16 items from the Indecision subscale at T1 into two empirically balanced measures. This procedure was followed exactly to create the T2 Indecision composites. The same procedure was then repeated to create the multi-item composites for the Career Decision-making Self-efficacy Scale. As there was an odd

number of pairs of items for this latter scale, the final (unpaired) item was allocated to the second composite. This procedure is the most widely used method for creating multi-item parcels (Landis et al., 2000).

Test of Measurement Model

Prior to testing the proposed cross-lagged structural models, we employed confirmatory factor analysis (AMOS 4 with maximum likelihood estimation; Arbuckle & Wothke, 1995) to test the extent to which the observed multi-item composite indicators measured the latent variables as intended. This was important, as testing the measurement model assesses construct validity of the variables utilized in the structural model (Bagozzi & Edwards, 1998). The measurement model consisted of four latent variables, each with two multi-item composite indicators as described in the Procedure section. The four latent variables were allowed to freely covary. The fit statistics for this analysis, $\chi^2(14) = 13.97$, $p = .45$, GFI = .98, AGFI = .95, TLI = 1.00, CFI = 1.00, RMSEA = .00, demonstrated a good fit to the data and indicated that it was appropriate to proceed with tests of the structural model (Byrne, 2001).

Test of cross-lagged structural models

We used AMOS 4 with maximum likelihood estimation to test and compare a series of nested cross-lagged panel models in which the parameters were progressively unconstrained. Cross-lagged models are designed to test the longitudinal associations between two different measures independent of the stability and contemporary associations of the measures. The first model tested was an autoregressive model (no lagged effects), which assumed that the only predictors of the variables at T2 were the same variables at T1. The second model added a cross-

lagged pathway from Career Decision-making Self-efficacy at T1 to Career Indecision at T2 to test the hypothesis that career decision-making self-efficacy was negatively related to changes over time in career indecision. The third model tested the reverse effect, of adding a pathway to the autoregressive model from Career Indecision at T1 to Career Decision-making Self-efficacy at T2. The fourth model tested a reciprocal effect that allowed for the estimation of both cross-lagged effects simultaneously. All models contained the same variables (Career Indecision and Career Decision-making Self-efficacy) which were measured at both times. T1 latent variable variances were allowed to covary, as were the T2 disturbances (Finkel, 1995; Taris, 2000).

Table 3 reports summary fit statistics for all analyses. All models demonstrated acceptable fit to the data. Model 2, which included a cross-lagged pathway from Career Decision-making Self-efficacy at T1 to Career Indecision at T2, was not statistically different from Model 1, the autoregressive model, χ^2 Difference Test (CSDT) = $\chi^2(1) = 0.25$, $p > .05$, indicating that career decision-making self-efficacy was not negatively related to changes over time in career indecision, as hypothesized. The cross-lagged pathway from Career Decision-making Self-efficacy at T1 to Career Indecision at T2 was non-significant, $\beta = -.02$, $p = .60$. Model 3, incorporating the reverse cross-lagged pathway from Career Indecision at T1 to Career Decision-making Self-efficacy at T2, was also not significantly different from Model 1, CSDT = $\chi^2(1) = 0.46$, $p > .05$. The reverse cross-lagged pathway in this model was non-significant, $\beta = -.10$, $p = .50$. Lastly, Model 4, which included both cross-legged pathways was not significantly different from Model 1, CSDT = $\chi^2(2) = 0.64$, $p > .05$. The cross-lagged pathway from Career Decision-making Self-efficacy at T1 to Career Indecision at T2 was non-significant, $\beta = -.02$, $p = .65$, as was the cross-lagged

pathway from Career Indecision at T1 to Career Decision-making Self-efficacy at T2, β = -.09, p = .54.

Table 3

Summary fit statistics for the four latent variables analyses

Model	χ^2	*df*	*p*	GFI	AGFI	TLI	CFI	RMSEA
1. Autoregressive	14.61	16	.55	.98	.95	1.00	1.00	.00
2. Cross-lagged (T1 CDMSE → T2 CI)	14.36	15	.50	.98	.95	1.00	1.00	.00
3. Cross-lagged (T1 CI → T2 CDMSE)	14.15	15	.51	.98	.95	1.00	1.00	.00
4. Reciprocal cross-lagged	13.97	14	.45	.98	.95	1.00	1.00	.00

In the autoregressive Model 1, modest synchronous associations were found at T1, r = -.40, p < .001, and at T2, , r = -.29, p < .001, indicating a same-time association between Career Decision-making Self-efficacy and Career Indecision. Notably, this was the case at T2 when previous levels of career indecision and career decision-making self-efficacy were partialled out. Both stability effects were significant, with Career Indecision at T1 significantly predicting Career Indecision at T2, β = .42, p < .001, and Career Decision-making Self-efficacy at T1 significantly predicting the same variable at T2, β = .39, p < .001. Taken together, these results suggest that, while the two variables were modestly associated at both times, the best predictor of Career Indecision at T2 was Career Indecision at T1, and the best predictor of Career Decision-making Self-efficacy at T2 was Career Decision-making Self-efficacy at T1. See Figure 1, which presents the estimated path model with standardized regression coefficients. For simplicity, we present the structural model rather than the full measurement model.

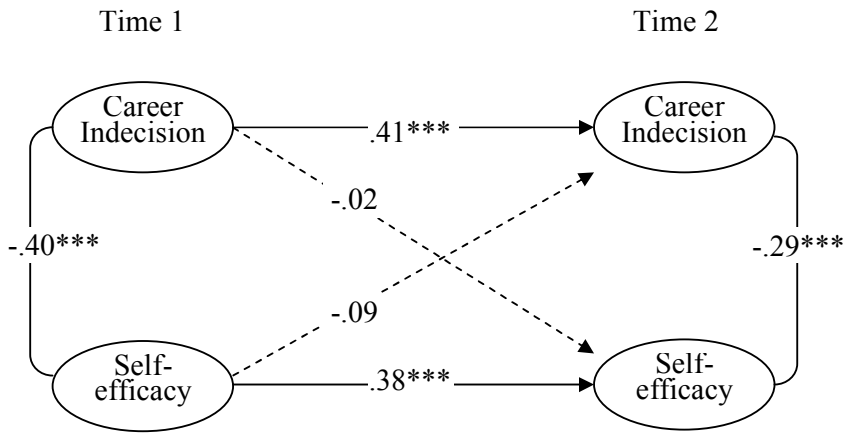

Figure 1. Latent variable model of the relationship between Career Indecision and Career Decision-making Self-efficacy across time. *** $p <$ .001, $N = 166$.

Discussion

Contrary to expectations, and in contrast to how the relationship between career decision-making self-efficacy and career indecision has been viewed in the literature, the present study found that a change in career decision-making self-efficacy was not associated with a change in career indecision over time. Nor was a change in career indecision associated with a change in career decision-making self-efficacy over time. It is possible then that there is no causal relationship between career decision-making self-efficacy and career indecision, as hypothesized by many process models (e.g., social cognitive career theory), such that, for example, early high levels of confidence may not buffer later career choice actions reflected in the career indecision construct.

If this is the case, there are several important theoretical and applied implications resulting from it. First, there are implications for how career decision-making self-efficacy is treated in the career literature in general, and specifically how it is treated in the social-cognitive models that have tested the relationship between career decision-making self-efficacy and career indecision. To date, these models have

included applications of Bandura's (1977) self-efficacy theory, Bandura's (1986) social-cognitive theory (see Lent, Brown, & Hackett, 1996), and Deci and Ryan's (1985) self-determination theory (e.g., Guay et al., 2003). Bandura's social-cognitive theory hypothesizes that self-efficacy influences behavioural outcomes directly as well as indirectly (by influencing outcome expectations, which in turn influence behaviours), and Deci and Ryan's theory incorporates autonomy, competence (self-efficacy) and relatedness as direct antecedents to behaviour.

The evidence from the present study is that career decision-making self-efficacy should not be viewed as a direct antecedent variable to career indecision; nor vice-versa, that career indecision be viewed as a direct antecedent to career decision-making self-efficacy. It is that case that the two variables showed modest correlations at T1 and T2, and should be viewed as distinct psychological constructs (unshared variance was 86% at T1 and 92% at T2). There are a number of possible explanations for not finding a cross-lagged effect between career decision-making self-efficacy and career indecision (and for not finding a bi-directional cross-lagged effect, when it might also be argued that reductions in career indecision would lead to increased levels of confidence). Several researchers have reported on trait based, as opposed to state based, career indecision (e.g., Creed, Prideaux, & Patton, 2005; Germeijs & de Boeck, 2002; Guay et al., 2003), which may also have underlying influences on levels of confidence and decidedness. We think this an important consideration, as the results of the study are consistent with such an interpretation.

It is possible that there are "third" variables that mediate the relationship between career decision-making self-efficacy and career indecision longitudinally. Bandura's social-cognitive model posits that outcome expectancies and goals might play such a role, and the social cognitive career theory (Lent et al., 1996) would suggest career

interests as another important consideration. These mediating relationships need to be tested using across-time methodologies. It is also possible that levels of career decision-making self-efficacy and career indecision are influenced by some third variable. Another consideration is the time lag used. A cross-lagged effect can reasonably be expected to occur if the time considered was long enough for career decision-making self-efficacy to influence career indecision but not so long that the effect would have worn off (Taris, 2000). We examined changes over a two-year lag period, which may have been too long for the relationship to be maintained. Future studies need to assess the causal relationships over different periods of time to gain a fuller picture; in particular, shorter time lags need to be considered. We also only included two waves of data, which is common for cross-lagged models (Taris), however, two waves assume a linear relationship between these two variables, and some other growth curve might be operating. A further limitation is sample used. First, a single sample of students was employed; and second, despite research suggesting that young children are career aware (Hartung et al., 2005) it may be that our T1 sample, measured when the students were in Grade 8, was too young and/or not sufficiently career focused. Year 8 is the first year of high school in Australia during which all students undertake a standard curriculum and are not required to make decisions that will impact upon their academic and career paths. Future research needs to test the across time relationship of these two variables with different age groups, especially older adolescents who clearly are in the process of considering their careers. Thus, the findings need to be viewed as preliminary, and additional studies need to be conducted to confirm this lack of a causal relationship between self-efficacy and career indecision.

Despite these limitations, the results from the current study raise questions as to the

true antecedents of career indecision. Based on cross-sectional regression models, several authors (e.g., Betz & Voyten, 1997; Taylor & Popma, 1990) have argued that self-efficacy is an important correlate and predictor of career indecision. However, future studies will need to identify the antecedents of this useful career construct, rather than relying on same-time data collection. This will be important, as reducing career indecision is a clear focus for career practitioners and career interventions, and valued by undecided individuals. Further to this, if the results of the current study are confirmed, career practitioners and developers of career interventions will need to consider tackling career indecision in a direct manner, for example, by assisting young people to clarify/identify career goals, rather than focusing on enhancing self-efficacy with the expectation that this will contribute to a reduction in indecision. The evidence from this study is that changing self-efficacy may not improve decision status.

This study has made an important contribution to the literature by teasing out the causal relationship between career indecision and career decision-making self-efficacy. However, because the results are counterintuitive and contrary to how the relationship is normally interpreted, it will be important for the study to be replicated. Future studies should also examine the causal relationship between career decision-making self-efficacy and career indecision in the context of other social-cognitive variables, such as outcome expectations and goal setting, test causal relationships in the context of wider array of variables, and examine different age groups, especially older adolescents, to allow stronger conclusions to be drawn.

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