Cross-lagged relationships between goal orientation and career aspirations in early adolescents

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Abstract

We surveyed 217 students (145 girls; average age = 14.6 years) on two occasions, twelve months apart, on measures of career aspirations (career aspirations and career expectations) and goal orientation (learning, performance-prove, performance-avoid), and tested the relationships between goal orientation and career aspirations over time. We assessed five plausible cross-lagged models (a baseline model testing stability and synchronous effects only, a standard causal model with added cross-lagged paths from goal orientation at T1 to the outcome variables at T2, a reverse-causation model, a reciprocal-causation model, and a model of best fit). We found significant, synchronous associations at T1 and T2 between all goal orientation predictors and the outcome variables, significant stability coefficients for all variables, and found support for a standard causal model, with performance-prove and performance-avoid orientation, but not learning orientation, predicting both career aspirations and career expectations at T2. We discuss the outcomes in relation to theory and the implications for practitioners and policy makers.

Keywords: career aspirations, career expectations, learning goal orientation, performance-prove goal orientation, performance-avoid goal orientation, cross-lagged

Career aspirations, which are "an individual's expressed career-related goals or choices" (Rojewski, 2005, p. 132), constitute a central component of many career development theories, where they are viewed as developing from wishful thinking to well-considered evaluations that take into account one's interests, abilities and opportunities (Gottfredson, 2002; Super, 1990). They develop early in childhood (Wahl & Blackhurst, 2000), and remain somewhat stable over time, for example, in terms of sex type (Junk & Armstrong, In press) and the level of prestige of the job aspired to (Rojewski & Yang, 1997), although they are responsive to change as a result of exposure to, and exploration of, the world of work, and insight into one's developing abilities and needs (Rojewski, 1997). Understanding career aspirations is important as they are key drivers in the career choice process. They influence the decisions that young people make in relation to their education and training, and they act as motivators for future occupational selection and achievement (Mau & Bikos, 2000; Schoon & Parsons, 2002). Furthermore, career aspirations set in train decisions that can have lifelong consequences, such as where one lives and works, and the quality of one's life.

A wide range of variables has been shown to be associated with career aspirations. These include background variables such as age, gender (Wahl & Blackhurst, 2000) and socio-economic status (Hellenga, Aber, & Rhodes, 2002), situational variables such as family and school environments (Bo, 1994), social support (Wall, Covell, & MacIntyre, 1999) and parental aspirations (Wilson & Wilson, 1992), and personality based variables such as self-esteem, self-efficacy (Fouad & Smith, 1996) and locus of control (Taylor, 1982). However, a consistent criticism of the research into career aspirations is that the studies have been largely cross-sectional, rather than

longitudinal; thus, making it difficult to tease out causal relationships between career aspirations and the other variables (Hartung, Porfeli, & Vondracek, 2005; Lee & Rojewski, 2009). The current study seeks to address this criticism by testing for change in career aspirations over time, and examining whether changes in career aspirations are associated with the particular goal orientation of the young person. We adopt a goal setting and self-regulatory perspective for the study. From this standpoint, once goals have been established, individuals use an array of self-regulatory processes to reduce any discrepancy between their current situation and where they want to be. Reducing discrepancies can include, for example, increasing goal directed behaviours in an attempt to achieve the desired goal, or lowering the desired goal to reflect current efforts. We view career aspirations as "career-related goals" (Rojewski, 2005, p. 132), and goal orientation as a part of the array of self-regulatory strategies that facilitate goal striving (Lord, Diefendorff, Schmidt, & Hall, 2010; Maes & Karoly, 2005).

Goal orientation refers to a person's preferred strategy for pursuing achievement-orientated goals (Dweck, 1986; VandeWalle, 1997). Individuals will have different interpretations of a situation, and behave differently, depending on whether they adopt a learning, performance-prove, or performance-avoid goal orientation. Goal orientation has been shown to be related to wide range of performance goals, including academic, sport and job performance (Kaplan & Maehr, 2007; Payne, Youngcourt, & Beaubien, 2007), and can be expected to be related to career aspirations, as these are achievement goals specific to the career development area.

Individuals with a *learning* goal orientation have a set of basic beliefs that influences the way they tackle their goals. First, they accept that ability and proficiency can be developed. Thus, they tend to set higher and more challenging

goals, as this is seen as a way of fostering ability and developing competencies (Dweck, 1986; Dweck & Leggett, 1988). Second, they believe that outcomes for themselves are contingent on the effort they expend (Ames, 1992), which means that they engage in more goal striving behaviours, such as planning, which enhances their chances of achieving their goals. Third, as a result of viewing ability as amenable to change through effort, they accept feedback on their performance, and use this feedback as motivation to either increase effort or revise their goals (Dweck, 1986; VandeWalle, Brown, Cron, & Slocum, 1999). As a result of setting higher goals, investing more effort, and regulating strategies based on feedback, learning orientated individuals have more positive experiences and better outcomes (Payne et al., 2007). Consistent with this, research has repeatedly demonstrated positive associations between a learning orientation and cognitive, affective and behavioural outcomes (Payne et al., 2007; Yeo, Sorbella, Koy & Smillie, 2008).

In contrast, individuals with a *performance-prove* orientation hold the belief that ability and competence are fixed characteristics. They also set high goals, but do so in order to elicit positive feedback from others on the ability they possess (Dweck, 1986). They focus on goals where there is a good chance of success (e.g., goals that are simpler and more manageable), as this strategy increases the chance of positive feedback. Also, as a result of believing that ability is more-or-less fixed, performance-prove individuals expend less effort on achieving their goals, as having to work hard is a sign of low ability. Further, their persistence is poorer as goals set to impress others are less intrinsically rewarding and motivating (Dweck, 1986; Dweck & Leggett, 1988). In their meta-analysis of the goal orientation construct, Payne et al. (2007) found positive associations between a performance-prove orientation and

outcomes, although the associations were generally weaker than for a learning goal orientation.

Whereas learning and performance-prove orientations are both approach orientations, the *performance-avoid* orientation is an avoidant one (Elliot & Thrash, 2002). Performance-avoid individuals also hold that ability is fixed, but their strategy is to protect themselves by working to keep from being seen as inept. They do this by setting low goals, withholding effort, and focusing on managing the negative affect associated with the risk of being exposed as being deficient (Elliot, Shell, Bouas Henry, & Maier, 2005; Middleton & Midgley, 1997). In line with this, research has consistently identified negative relationships between a performance-prove orientation and striving and performance (Payne et al., 2007).

Goal orientation can be considered "a quasi-trait or a personal preference that may be influenced by situational characteristics" (van Hooft & Noordzij, 2009, p. 1581). Thus, like career aspirations, it is expected to change over time as a result of development and experiences. However, most examinations of the construct have been cross-sectional, meaning that the causal relationships between goal orientation and other variables have yet to be determined. Payne et al. (2007) concluded their meta-analysis with a call for longitudinal studies to test the temporal relationships between goal orientation and the goals people set or are given. Specifically, for the current study, we found very few studies that tested career aspirations over time, and found no studies that tested the relationship between career aspirations and self-regulatory strategies across time.

Researchers in the area interpret goal orientation as an antecedent to achievement goals; that is, goal orientation affects goal achievement (Kaplan & Maehr, 2007; Payne et al., 2007). Thus, while the relationship between goal orientation and career

aspirations may be deduced from theory (i.e., goal orientations come before, and affect the level and breadth, of career aspirations), there is little empirical evidence to support such a proposition. Apart from this standard causal relationship, other forms of causation are possible, namely reverse causation and reciprocal causation (Zapf, Dorman, & Frese, 1996). Reverse causation assumes that the causal effects are opposite to those of the standard causal relationship. For example, having established career aspirations, an individual may then change his or her perspective on how to go about achieving them, leading to a change in the normal goal achievement strategy (i.e., career aspirations come before, and affects, the type of goal orientation strategy employed). Reciprocal causation assumes that career aspirations and goal orientation influence one another over time. Several authors have recommended that fully crosslagged panel models, which are analysed using latent variable analysis, are required to comprehensively assess these competing longitudinal models, as all three types of causal relationships can be distinguished and assessed (de Jonge, Dormann, Janssen, Dollard, Landeweerd, & Nijhuis, 2001; de Lange, Taris, Kompier, Houtman, & Bongers, 2003; Zapf et al., 1996).

In line with these recommendations, the current study used data from a fully cross-lagged panel design, in which all variables were assessed at both times, to test competing causal models to assess the relationships between goal orientation and career aspirations. First, we assessed a baseline model, in which across-time stability effects only were included. We then assessed which of a standard causal model (cross-lagged paths from goal orientation to career aspirations), a reverse-causation model (cross-lagged paths from career aspirations to goal orientation) and a reciprocal-causation model (cross-lagged paths from goal orientation to career aspirations and cross-lagged paths from career aspirations to goal orientation)

provided the best explanation of the data over and above the baseline model. We concluded by assessing a final model of best fit between goal orientation and career aspirations. While longitudinal panel designs cannot "prove" causality, they do allow the relative assessment of possible causal relationships (Burkholder & Harlow, 2003). Based on previous theory and research (Dweck, 1986; Payne et al., 2007), our general expectations were that goal orientation at T1 would affect career aspirations at T2. Specifically, we hypothesised that learning and performance-prove goal orientations would be positively associated with career aspirations at T2, and that performance-avoid goal orientation at T1 would be negatively associated with career aspirations at T2, reflecting the standard causal model. We assessed these possible causal models on two related career aspiration outcome variables. As career aspirations can be characterised as either idealised (aspirations unrestrained by perceived or actual limitations of opportunity, finances and individual capacity) or realistic (aspirations settled for in the light of limitations; otherwise known as expectations; Rojewski, 2005), we assessed both career aspirations and career expectations.

Method

Participants

We surveyed 491 school students across several schools in Queensland, Australia at T1, and received complete responses from 204 students at T2 for the career aspirations outcome variable. These were 138 girls (67.7%) and 66 boys, whose mean age at T1 was 14.6 years (SD = 1.3; range = 12.6 to 17.7), and of whom 129 (63%) were enrolled in middle school and 75 enrolled in high school. We received complete responses from 174 students at T2 for the career expectations outcome variable (64.4% female; mean age = 14.6; SD = 1.2).

Materials

Career aspirations and expectations. For career aspirations, we used a single open-ended question, devised by Looft (1971), and used widely in the literature (e.g., Watson, Quatman, & Edler, 2002), which asked: "If you were completely free to choose any job you like, what job would you MOST LIKE to have?". We then rated the job aspired to on the level of job complexity using the Dictionary of Holland Occupational Codes (Gottfredson & Holland, 1996). The job complexity rating provides an estimate of the skills and training required to meet the mental demands of the job (e.g., medical practitioner is rated as high complexity, whereas farmer is rated as low). For career expectations, we used a similar, single, open-ended question: "Sometimes we are not able to do what we want most. What job to you REALLY EXPECT to have?". We rated these responses for job complexity using the same procedure as we used for rating job aspirations. Both the career aspirations and career expectations questions were rated independently by two researchers and any variations in the ratings of complexity were discussed and resolved prior to the analyses.

Goal orientation. We used nine items based on a scale devised by Meece and Miller (2001). Sample items were, "I like school work that I'll learn from, even if I make a lot of mistakes" (learning), "I'd like to show my teachers that I'm smarter than the other students in my classes" (performance-prove), and "It's very important to me that I don't look stupid in my classes" (performance-avoid). The nine items chosen were based on prior use by the authors. Confirmatory factor analyses demonstrated a good fit for a three factor model at T1, $\chi^2(24) = 49.58$, p = .002, $\chi^2/df = 2.07$, CFI = .96, RMSEA = .07, and T2, $\chi^2(24) = 45.99$, p = .004, $\chi^2/df = 1.92$, CFI = .96, RMSEA = .07. Internal reliability coefficients, respectively, were .82, .79 and .60 at T1, and .76, .82 and .64 at T2.

Procedure

We collected data at two points in time, approximately one year apart, using the same items at each time. The one year time lag was considered sufficient to allow for changes to occur in the students' career development. We had little information on the students who dropped out of the study from T1 to T2. We lost some students who had left school to join the labour force or to undertake post-secondary schooling; some students had transferred to another school; and some declined to participate in this second round of surveys. As an encouragement to participate, students who completed the surveys had their names placed in a draw to win a prize. The data form part of a larger mixed-methods study assessing adolescent career development. The study was approved by the authors' university ethics committee.

Results

Attrition Analysis

The attrition rate from T1 to T2 was 58.5%. We tested whether the students who dropped out of the study (i.e., did not complete the T2 survey) differed from those who stayed in, on all T1 variables. Drop-outs did not differ from stayers in terms of career aspirations, career expectations, learning goal orientation, performance-prove goal orientation, performance-avoid goal orientation and gender. However, as a group they were older (M = 14.9 vs. 14.6 years, p = .002) and reported lower levels of educational achievement (M = 3.9 vs. 3.6, p = .001; 5-point rating scale from "pretty low – bottom 10%" to "pretty high – top 10%"), indicating some bias in the sample that we used for the analyses compared with the original T1 sample. Results need to be interpreted with this in mind.

Summary Data

Table 1 includes summary data and bivariate correlations. Test-retest correlations for all variables were in the .47 to .55 range, indicating moderate levels of stability across the time lag. The outcome variables were significantly correlated with one another (.57 at T1; .64 at T2); and the associations between goal orientation and the outcome variables were in the expected directions, with learning and performance-prove orientations having positive correlations with the outcome variables and performance-avoid orientation having negative correlations.

<u>Insert Table 1 about here</u>

Steps in Model Testing

First, we assessed the measurement models for all variables used in the analysis. We did this by conducting item-level confirmatory factor analyses using AMOS software, in which we assessed data from the two times simultaneously. Learning, performance-prove and performance-avoid goal orientations were each represented by three items on the two occasions; career aspirations and career expectations were represented by one item on each occasion. As single items in latent variable analyses are assumed to be measured without error, we set the error variance for these latter items to zero (Kline, 1998). As it is assumed that measurement error covaries across time, we modelled these covariances from T1 to T2 (Kline, 1998). Finally, we tested age, gender and educational achievement as control variables, and included educational achievement in all analyses, even though Taris (2000) has argued that the effect of control or third variables is limited in longitudinal designs, as participants are able to act as their own controls (also see de Lange, Taris, Kompier, Houtman, & Bongers, 2003, for fuller a discussion on the use of control variables). The bivariate correlations between goal orientation and age (T1 range = -.12 to -.04; T2 range = -.14 to -.01) and gender (T1 range = -.01 to .06; T2 range = .06 to .14), and between the two career aspiration measures and age (T1 = -.03 and -.02; T2 = .03 and .05) and gender (T1 = -.04 and .06; T2 = -.04 and -.03), were trivial. The bivariate correlations between career aspiration and career expectations and educational achievement were .37 and .38 at T1, and .31 and .36 at T2, respectively.

We assessed model fit using four statistics: the χ^2 statistic, χ^2/df , the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). The χ^2 statistic and the CFI compare the specified model to a model with complete independence, while the RMSEA estimates the error due to the approximate fit of the model. A non-significant χ^2 , CFI values > .90 to .95, and RMSEA values < .05 to .08 indicate a satisfactory model fit (Byrne, 2001). As the χ^2 statistic is sensitive to sample size, it should be interpreted with caution, and a χ^2 value two to three times greater than the degrees of freedom can be accepted as indicating a satisfactory model fit (Kline, 1998). The three measurement model analyses confirmed that 4-factor models across two times fitted the data quite well. See Table 2 for fit statistics.

<u>Insert Table 2 about here</u>

Second, to test the cross-lagged causal relationships between goal orientation (learning, performance-avoid, performance-prove) and aspirations (career aspirations, career expectations), we assessed and compared four models for each of the outcome variables: (a) a baseline model, which included stability (across-time) and synchronous (within-wave) effects, and no cross-lagged effects; (b) a standard causal model, which added cross-lagged paths to the baseline model from the goal orientation variables at T1 to the outcome variables at T2; (c) a reverse-causation model, which added cross-lagged paths to the baseline model from the outcome variables at T1 to the goal orientation variables at T2; and (d) a reciprocal-causation model, which added cross-lagged paths to the baseline model from the goal

orientation variables at T1 to the outcome variables at T2, and from the outcome variable at T1 to the goal orientation variables at T2. We used the chi-square difference test to assess differences among the competing nested models, and accepted the most parsimonious model when differences were not identified (Kline, 1998). We tested for parsimony using the Akaike (AIC) statistic, where the lowest value is an indication of best fit (Akaike, 1987). We first assessed model differences based on adding cross-lagged paths as a group, and then, based on these results, used fit and path significance to identify (e) a model of best fit for each of the outcome variables. Models (b) to (e) indicate effects over and above the baseline stability effects found in (a). All models include educational achievement as a covariate. Results of these analyses are reported in Table 2.

For career aspirations, the standard causal model ($\Delta\chi^2 = 9.31$, $\Delta df = 3$, p < .05), but not the reverse-causation ($\Delta\chi^2 = .63$, $\Delta df = 3$, p > .05) or the reciprocal-caustaion model ($\Delta\chi^2 = 9.95$, $\Delta df = 6$, p > .05), was significantly different from the baseline stability model. We accepted the standard causal model. When we examined the standard causal model, educational achievement was not significantly associated with any outcome measures, and the pathway from learning goal orientation at T1 to career aspirations at T2 was non-significant. These pathways were removed. This best fit model did not differ statistical from the standard causal model ($\Delta\chi^2 = 8.03$, $\Delta df = 5$, p > .05); however, it was accepted as it was the simpler model. As a test of parsimony, the AIC statistic was consistent with the chi-square difference and parsimony principle, being the lowest for the final best fit model. Using the same steps, the best fit model was accepted for career expectations. The best fit model for each outcome variable included significant stability pathways, and significant pathways from performance-prove orientation at T1 and performance-avoid orientation at T1 to the

outcome variable at T2. Figure 1 reports the standardised effects for both outcome variables.

<u>Insert Figure 1 about here</u>

Discussion

First, the study showed that career aspirations and goal orientation were both somewhat stable over the 12 month period between T1 and T2, with stability coefficients for career aspirations at .54 and for career expectations at .55, and for goal orientation ranging from .47 to .49. These results are consistent with previous studies. For example, Chan (2003) found stability coefficients for career aspirations ranged from .56 to .61 for year 10 students over a one year period, and Junk and Armstrong (In press) found stability coefficients ranging from .64 to .74 in an older sample (age range 16 to 47 years), again over a one year period. For goal orientation, Payne et al. (2007) reported mean coefficients ranging from .66 to .73, for periods of one to fourteen weeks, but indicated that the coefficients became smaller as the lag became longer. These results suggest that both variables are amenable to change, and allows for the possibility of identifying explanations for that change.

Our results lend partial support to a standard causal relationship between goal orientation and career aspirations. Positive cross-lagged pathways were identified from performance-prove orientation at T1 to the two career aspirations outcome variables at T2, and negative cross-lagged pathways were found from performance-avoid orientation at T1 to the outcome variables at T2. While significant stability pathways were found for career aspirations at T1 to career aspirations at T2, the addition of the cross-lagged pathways from performance-prove and performance-avoid orientations provided a better explanation of the data, even after controlling for

educational achievement. There was little support for reverse or reciprocal causation.

To our knowledge, this is the first time these relationships have been demonstrated.

For performance-prove orientation, the results suggest that those high on this construct were likely to aspire to high career occupations over time; that is, maintain their high occupational aspirations and expectations over a one year period. Similarly, for performance-avoid orientation, those high on the avoidant construct were also likely to maintain their low aspirations over time. These results are consistent with goal orientation theory (Dweck, 1986; VandeWalle, 1997), and consistent with results reported in recent reviews for cross-sectional studies (Kaplan & Maehr, 2007; Payne et al., 2007). They suggest a causal link between performance-prove and performance-avoid orientations and career aspirations, rather than a reverse or reciprocal causation explanation. While we found significant stability pathways for learning goal orientation between T1 and T2, we did not find any cross-lagged effects supporting a causal relationship.

Previous research has consistently shown that holding a performance-avoid orientation is associated with negative outcomes for the individual, and this was the case in the current study. Holding a performance-avoid orientation at T1 was associated with having low aspirations at T1, and was associated with choosing low level occupations at T2. Those who help young people with their career decision-making need to be aware that those with a high avoidance orientation are likely to persist with their low aspirations unless their poor achievement orientation is addressed. Previous studies have identified a constellation of self-handicapping strategies used by performance-avoid individuals (e.g., avoiding help-seeking, low levels of persistence), and have shown that this avoidance approach is associated with low self-efficacy and high anxiety (Urdan, Ryan, Anderman, & Green, 2002), which

also may need to be addressed. Interventions have been devised to foster approach mastery for educational achievement in children (see Kaplan & Maehr, 2007) and jobseeking in adults (van Hooft & Noordzij, 2009), and variations of these need to be trialled with young people when their focus is on career development and achievement.

A perfomance-prove orientation has also been associated with positive outcomes, although mostly is situations where the goals set are less complex or can be routinised (Utman, 1997). When more complex goals are set, a learning goal orientation gives greater advantages. Performance-prove individuals focus on demonstrating their competence and eliciting favourable responses from others in relation to their achievements (VandeWalle, 1997). While the current study demonstrated that performance-prove was associated with higher aspirations at T1, and aspiring to higher occupational goals at T2, the question to be asked here is whether these higher aspirations reflect realistic, well thought-out choices based on self- and world-ofwork-exploration, or whether they reflect an ongoing need to be seen as competent in the eyes of others. If the latter, then having a performance-prove orientation and associated higher goals is dysfunctional, as long-term outcomes, such as occupational satisfaction and success, are likely to be compromised. The current study cannot determine whether this is the case; however, based on theory and previous evidence, performance-prove individuals would also benefit from mastery-focused interventions.

At both T1 and T2, the strongest positive synchronous associations were between learning goal orientation and career aspirations/expectations. Further, learning goal orientation at T1 was significantly, bivariately associated with career expectations at T2. Despite these same-time and longitudinal associations, we found no support for a

causal relationship between a learning orientation and career aspirations or career expectations, over and above the T1 to T2 stability relationships. The positive explanation for this, based on goal orientation theory, is that, over time, learningorientated students are exploring and developing, and realigning their career choices based on preferences and interests, and are not simply choosing highly rated occupations to create a good impression, or choosing lowly rated occupations to avoid being exposed as wanting. Consistent with this, learning goal-orientation has been shown to be associated with positive coping (Elliott & Dweck, 1988), self-regulated learning (Graham & Golan, 1991) and help seeking (Ryan & Pintrich, 1998), all behaviours that reflect the self- and environmental-exploration required before settling on a career. Future studies need to test these and other variables as possible mediators between learning goal orientation and career choice. For example, a learning orientation may increase help seeking, which may lead to better self- and environmental-understanding, which, in turn, may lead to occupational choices that provide a better fit for the individual. In career development language, performanceprove and performance-avoid individuals may have prematurely foreclosed on their occupational choices (see Vondracek & Porfeli, 2003) because of their needs in achievement situations, whereas learning orientated individuals are persevering with developmentally appropriate exploratory, learning and mastery behaviours.

While this study benefitted from using a fully cross-lagged panel design, the results should be considered in the context of a number of limitations. First, we used self-report data on both occasions, which might have inflated associations due to common method variance, although this is less of a risk for this type of methodology (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). Future studies might look to use measures of real-life outcomes, such as actual course enrolments or entry to training

programs. Second, our outcome measures were all single-item measures. While single item measures have been criticised (e.g., for their content coverage), empirical studies have shown single items to be as valid as multiple items for measuring constructs (Bergkvist & Rossiter, 2007). Career aspirations can be conceptualised as a multi-dimensional construct, for example, based on job characteristics aspired to (e.g., Warr, 1999) or occupational needs met (Holland, 1985), and future studies might examine the relationship between goal orientation and different domains of career aspirations. Third, our sample was drawn from within one State boundary and exhibited some bias brought about by selective students dropping out of the study. Future studies need to test the associations on more heterogeneous samples to allow for wider generalisations. Fourth, we tested causal relationships across one time lag of twelve months. To gain a fuller understanding of the role of goal orientation in career choice, these relationships need to be tested across multiple waves, and tested across different time lags. Our time lag covered a single calendar year, and did not assess change over time that included an important transition. Elliot and McGregor (1999) found different relationships between goal orientation and exam results depending on whether the exam was important or not, suggesting that goal orientation may operate differently when there is pressure associated with meeting achievement The effect of goal orientation needs to be assessed across the important transition points for career development, such as final selection of school subjects and entering particular educational pathways. Finally, our sample was too small to test for group differences (e.g., gender, age, SES), and future studies need to examine whether goal orientation operates differently for particular groups of students. Despite these limitations, the current study added to our understanding of the career choice process

for school students, has raised questions to be tested, and provided suggestions for practitioners who work with children making career decisions.

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Table 1
Summary Data and Bivariate Correlations

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1. Career aspirations T1	60.95	8.63	1	.57***	.19**	.12	16*	.54***	.52***	.11	.01	18**
2. Career expectations T1	58.84	8.86		1	.23**	.07	20**	.36***	.55***	.14	.03	26***
3. Learning goal orientation T1	11.41	2.53			1	.32***	02	.10	.22***	.47***	.12	05
4. Performance-prove goal orientation T1	10.35	2.94				1	.31***	.17*	.21**	.16*	.47***	.13
5. Performance-avoid goal orientation T1	8.31	2.42					1	18**	21**	.01	.23**	.49***
6. Career aspirations T2	61.12	8.42						1	.64***	.14*	.06	22**
7. Career expectations T2	59.09	9.06							1	.16*	.13	20**
8. Learning goal orientation T2	11.20	2.42								1	.20**	09
9. Performance-prove goal orientation T2	10.34	2.95									1	.37***
10. Performance-avoid goal orientation T2	8.34	2.58										1

Note: Sample size for career aspirations = 204, and for career expectations = 174. * p < .05, ** p < .01, *** p < .001.

Table 2
Fit Statistics for Latent Variable Analyses

Models	N	χ^2	df	χ^2/df	CFI	RMSEA	AIC
Measurement Models				7.			
Career aspirations	204	224.90***	153	1.47	.95	.05	380.90
Career expectations	174	209.90**	153	1.37	.96	.05	365.90
Baseline Models							
Career aspirations	204	226.04**	164	1.38	.96	.04	360.04
Career expectations	174	211.62**	164	1.29	.96	.04	345.62
Standard Causal Models							
Career aspirations	204	216.73**	161	1.35	.96	.04	356.73
Career expectations	174	201.31*	161	1.25	.97	.04	341.31
Reverse-causation Models							
Career aspirations	204	225.41**	161	1.40	.96	.04	365.41
Career expectations	174	210.41**	161	1.31	.96	.04	350.41
Reciprocal-causation Models							
Career aspirations	204	216.09**	158	1.37	.96	.04	362.09
Career expectations	174	200.04*	158	1.27	.97	.04	346.04
Best Models							
Career aspirations	204	224.76**	166	1.35	.96	.04	354.76
Career expectations	174	205.99*	166	1.24	.97	.04	335.99

^{*} p < .05, ** p < .01, *** p < .001

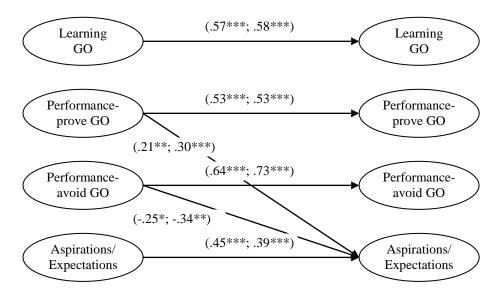


Figure 1. Simplified final best fit models, with standardised regression weights. The first regression weight in the brackets refers to career aspirations as the outcome variable; the second refers to career expectations as the outcome variable.