

Running head: OPTIMISM AND ACADEMIC SATISFACTION

Running head: OPTIMISM AND ACADEMIC SATISFACTION

Beyond Conscientiousness: Career Optimism and Satisfaction with Academic Major

Peter McIlveen, Gavin Beccaria, & Lorelle J. Burton

University of Southern Queensland

AUTHORS' NOTES

Peter McIlveen, Faculty of Education, University of Southern Queensland, Toowoomba, Queensland, Australia; Gavin Beccaria, Faculty of Sciences, University of Southern Queensland, Toowoomba, Queensland, 4350, Australia; Lorelle J. Burton, Faculty of Sciences, University of Southern Queensland, Toowoomba, Queensland, 4350, Australia.

Correspondence concerning this article should be addressed to Dr Peter McIlveen, Faculty of

Education, University of Southern Queensland, Toowoomba, Queensland, 4350. +61 7

46312375. Email: peter.mcilveen@usq.edu.au

Abstract

The study focuses on psychological predictors of academic major satisfaction. According to the career construction theory (Savickas, 2005), vocational personality and career adaptability should generate career satisfaction. In this study, vocational personality was operationalized as Big Five conscientiousness, and career adaptability was operationalized as generalised self-efficacy and career optimism. A sample ($N = 529$) of university students completed an online survey. The resultant data were used to construct a structural model of the hypothesized relationships among variables. A good fitting model [$\chi^2 = 10.454$ (7) $p = .164$; GFI = .993; CFI = .999; RMSEA < .031 (<.001 - .066)] indicated that career optimism fully mediated the relationship between conscientiousness and academic major satisfaction. Results were consistent with previous research into personality and academic performance. Moreover, the results highlight the significant role of optimism in satisfaction with career generally, and studies, specifically. Suggestions are made for future research into modelling the relationships according to different academic disciplines and for the potential role of optimism as a learning objective for career education and counseling.

Keywords: academic major satisfaction; conscientiousness; career optimism; career construction theory

Beyond Conscientiousness: Career Optimism and Satisfaction with Academic Major

University students' satisfaction with their studies is an important matter for themselves, their teachers, their institutions, and public bodies that scrutinise universities. Indicators of students' satisfaction are associated with institutional reputation in an increasingly international market place. In their review of over 7000 publications, Richardson, Abraham, and Bond (2012) classified 42 *non-intellective* correlates of academic performance into five classes: personality traits, motivational factors, self-regulatory learning strategies, students' approaches to learning, and psychosocial contextual factors. These, so-called non-intellective factors represent sites of psychological or educational interventions that aim to enhance students' engagement and satisfaction with their studies (e.g., teaching study techniques according to approaches to learning). In this paper, we address facets of two of the non-intellective predictors of student satisfaction with their academic major: the personality factor *conscientiousness* and the motivational factors *self-efficacy* and *optimism*.

Career Construction Theory and Academic Satisfaction

To conceptually frame the research, we referred to the career construction theory (Savickas, 2005) that provides an integrative conceptual framework to understand career in terms of three inter-related domains: *vocational personality*, *career adaptability*, and *life themes*. Students' engagement with their studies can be understood from the perspective of these conceptual domains. The first two classes of non-intellective correlates of academic performance identified by Richardson et al. (2012) conceptually correspond to vocational personality (i.e., personality factors) and career adaptability and life themes (i.e., motivational factors).

Vocational Personality. The notion of personality pertains to stable occupational interests, traits, abilities, needs, and values that can objectively describe a person. For example, the most notable vocational interest framework (Holland, 1997) describes Realistic, Investigative, Artistic, Social, Enterprising and Conventional occupations and work environments, respectively abbreviated as R, I, A, S, E, and C. The congruence between vocational interests and choice of academic major is a reliable predictor of academic performance, more so than academic abilities (Tracey & Robbins, 2006). According to this framework, students are most satisfied if they are enrolled in an academic program that is consistent with their interest type (e.g., Realistic: engineering; Investigative: laboratory sciences; Artistic: literature; Social: psychology; Enterprising: marketing; Conventional: accounting).

From another perspective of personality, the Five Factor Model (FFM) of personality (McCrae & Costa, 2003) has been upheld across cultures, including translations into German, Portuguese, Hebrew, Chinese, Korean, and Japanese (McCrae & Costa, 1997). The FFM subsumes the personality factors *neuroticism*, *extraversion*, *openness to experience*, *agreeableness*, and *conscientiousness*. The factor conscientiousness reliably links to academic performance. Conscientiousness is of most relevance to this study and pertains to personal characteristics of being diligent, reliable, efficient, responsible, organised, dutiful, achievement-oriented, and goal-directed. It could be expected that a student high in conscientiousness is committed to and engaged in his/her studies of a particular academic major and is keen to put in the effort to pursue his/her career objectives.

The aforementioned expectations of a conscientious student are empirically borne out in a series of large-scale meta-analytic studies that address personality factors and grade point average (GPA). O'Connor and Paunonen (2007) found that conscientiousness correlated moderately with academic performance ($r = .24$, 90% CI [.12, .36]). Poropat's (2009) meta-

analytic study, that was based upon an aggregate sample size of 70926, found that the correlation between conscientiousness and academic performance had a moderate effect size of Cohen's $d = .46$; which was similar to the moderate effect size of the correlation between intelligence and academic performance, Cohen's $d = .52$. Taken together, these meta-analytic studies present unequivocal evidence of the positive relationship between the personality factor conscientiousness and academic performance. Richardson et al. (2012) found that among the Big Five personality factors, conscientiousness was the strongest correlate of GPA ($r^+ = .19$, 95% CI [.17, .45]). As expected, procrastination was significantly negatively correlated with GPA ($r^+ = -.22$, 95% CI [-.18, -.27]). The studies by O'Connor and Paunonen and Richardson et al. both indicate ostensibly small correlation coefficients between conscientiousness and GPA. However, their relative effects should be considered in light of the fact that GPA is a high-stakes outcome for students, and any factor that contributes to a high-stakes outcome deserves due consideration. Indeed, Poropat's study demonstrates that conscientiousness almost has the same effect as intelligence on GPA.

Despite the importance of satisfaction with academic major, there has been relatively little research into its relationship with personality (Logue, Lounsbury, Gupta, & Leong, 2007). Lent, Singley, Sheu, Schmidt, and Schmidt (2007) recommended that future research examine the influence of personality traits and affective states on academic satisfaction. Using a one-item measure of academic major satisfaction administered in sample of undergraduate business students, Logue et al. (2007) found that optimism, conscientiousness, and extraversion together predicted 38% of the variance in major satisfaction. In secondary analyses, optimism sustained its predictive capacity (of 8%) in the presence of other predictors such a type of vocational interest (e.g., Realistic) and assertiveness. Thus, in the current study, we sought to further explore whether the personality factor conscientiousness

in combination with motivational factors, namely optimism and self-efficacy, influence academic satisfaction.

Career Adaptability. Savickas (2005) described career adaptability as attitudes, beliefs, and competencies clustered as four dimensions: developing a positive *concern* for a career future, enhancing personal *control* over that future, enacting *curiosity* to explore future career scenarios, and enhancing personal *confidence* to pursue future scenarios. With respect to non-intellective motivational factors, career adaptability pertains to a student's readiness and capacity to manage the challenges and demands of study.

According to career construction theory, career-related optimism is a non-intellective motivational factor reflecting expectations of "the best possible outcome or to emphasise the most positive aspects of one's future career development, and comfort in performing career planning tasks" (Rottinghaus, Day, & Borgen, 2005, p. 11). In this way, an optimistic student is keenly interested in his/her career future, enthusiastically engages in learning that is directly related to that imagined future, and feels comfortable that he/she is on the appropriate path for career success. Such students should evince high levels of satisfaction with their academic studies and career choices.

A conceptual distinction is to be made between generalised *dispositional optimism* and optimism specific to a particular behavioural domain, in this case the academic domain (Solberg Nes, Evans, & Segerstrom, 2009). In their study that differentiated between dispositional optimism and academic optimism (i.e., belief in chance of good grades), Solberg Nes et al. (2009) found that dispositional optimism and academic optimism were associated with enhanced student retention, however, their effects were mediated by other motivational factors. Academic optimism had a direct, albeit relatively small, predictive effect upon GPA, whereas dispositional optimism had no effect. Although GPA provides contextual validity for the current study, it is not the variable of primary interest; instead we

focus upon satisfaction with academic major. Furthermore, the current study addresses optimism specific to career, as distinct from the global optimistic outlook of dispositional optimism and academic optimism. Richardson et al. (2012) found that optimism has a smaller correlation ($r^+ = .11$, 95% CI [.04, .17]) with GPA than does conscientiousness and the other motivational factors.

In a study of first-year Australian students, McKenzie and Schweitzer (2001) found that academic self-efficacy correlated with GPA. McKenzie and Schweitzer further found that a global attribution style, reflective of a dispositional optimistic outlook, did not positively correlate with GPA. However, a small negative effect was evident for a negative attribution style—the ostensible opposite of a positive attribution style. This result is consistent with earlier research that found a negative attribution style was associated with lower GPA (Peterson & Barrett, 1987). Thus, albeit equivocal, there is evidence to suggest that a positive attribution style (or more accurately, its opposite, a negative attribution style) may relate to GPA; however, the directness and size of its effect is not as clear as the personality factor conscientiousness and motivational factor academic self-efficacy.

Self-efficacy and performance expectations may also be subsumed as features of career adaptability, and they are key non-intellective predictors of academic goals and outcomes (Lent, Brown, & Hackett, 1994). Self-efficacy positively contributes to a sense of satisfaction with academic major (Lent et al., 2005; Lent et al., 2007; Singley, Lent, & Sheu, 2010). Again, referring to a series of meta-analytic studies and the motivational factors that can be subsumed under career adaptability, Valentine, DuBois, and Cooper (2004) found a small relationship ($\beta = .08$, 95% CI $\pm .02$) between a cluster of self-beliefs (e.g., self-efficacy, self-concept, self-esteem) and GPA, with domain-specific academic self-beliefs slightly stronger in effect ($\beta = .13$, 95% CI $\pm .02$). Richardson et al. (2012) found that academic self-efficacy ($r^+ = .32$, 95% CI [.28, .34]), performance self-efficacy ($r^+ = .59$, 95% CI [.49, .67]),

and goals for grades ($r^+ = .35$, 95% CI [.28, .42]) had moderate correlations with GPA.

Robbins et al. (2004) similarly found that academic self-efficacy and achievement motivation were moderate correlates of GPA. Recent research published subsequent to these major meta-analytic studies suggests that the motivational factor academic self-efficacy may have a direct effect on GPA (Brown et al., 2008) and mediate the relationship between personality factors and academic performance (De Feyter, Caers, Vigna, & Berings, 2012).

Method

Participants

There were 529 participants, all students of a medium-sized regional university in Australia. The participants' ages ranged from 17 to 64 years ($M = 31.86$, $SD = 11.46$); 351 (66.4%) were female and 178 (33.6%) were male. The mean age was consistent with the demographic profile of the university, which is a major provider of distance education to mature-aged students. The proportions according to disciplinary studies were: Arts ($n = 59$, 11.2%), Business ($n = 139$, 26.3%), Education ($n = 133$, 25.1%), Engineering and Surveying ($n = 93$, 17.6%), Sciences ($n = 100$, 18.9%), and Other ($n = 5$, .90%). GPA ($M = 5.58$, $SD = .95$) ranged from 3 = *fail*, 4 = *pass*, 5 = *credit*, 6 = *distinction*, to 7 = *high distinction*. There were 326 (61.6%) new students and 203 (38.4%) continuing students.

Measures

Career Futures Inventory (CFI). The CFI (Rottinghaus et al., 2005) is a 21-item measure of career optimism (CO), career adaptability (CA) and knowledge of the world of work (PK). The CFI uses a 5-point Likert-type scale (1 = *Strongly disagree*; 5 = *Strongly agree*). Internal consistencies reported by Rottinghaus et al. (2005) were: $\alpha = .87$ for CO; $\alpha = .85$ for CA; and $\alpha = .73$ for PK. Note that CO described in this scale is conceptually subsumed by the construct of career adaptability in the career construction theory; however

that theory's take on optimism is of interest here. In this study, internal consistencies were $\alpha = .86$ for CO; $\alpha = .86$ for CA; and $\alpha = .86$ for PK

Career Choice Status Inventory (CCSI). The CCSI (Savickas, 1993) is a 6-item measure of a person's satisfaction with chosen career field and occupation choice. The CCSI uses a 5-point Likert-type scale (1 = *Very dissatisfied and intend to change*; 5 = *Well satisfied with choice*). In the current study, the CCSI showed acceptable internal consistency ($\alpha = .75$), consistent with previous research (Lewis & Savickas, 1995).

Academic Major Satisfaction Scale (AMSS). While acknowledging measures of specific facets of students' general satisfaction (e.g., quality of teaching, instructional materials), Nauta (2007) constructed the AMSS as a six-item measure specific to academic major per se. AMSS uses a 5-point Likert-type scale (1 = *Strongly disagree*; 5 = *Strongly agree*). The AMSS is an important technical advance because it corresponds to established career-related variables such as career-decision self-efficacy and career choice anxiety, and general academic variables such as GPA. Nauta (2007) reported internal consistency of $\alpha = .94$ and $\alpha = .90$. In the current study, $\alpha = .91$, showing acceptable reliability.

Generalized Self-Efficacy Scale (GSES). The GSES (Schwarzer & Jerusalem, 1995) is a 10-item measure of sense of confidence and mastery for a range of domains. The GSES uses a 5-point Likert-type scale (1 = *Strongly disagree*; 5 = *Strongly agree*). Schwarzer and Jerusalem (2000) reported internal consistency coefficients of $\alpha = .76$ and $\alpha = .90$. In the current study, $\alpha = .82$, showing acceptable reliability.

NEO Five Factor Inventory (NEO-FFI). The short-form of the NEO-FFI (Costa & McCrae, 1992) was used to measure conscientiousness specifically; although measured concurrently, the four other personality factors were not for analysis. The NEO-FFI uses a 5-point Likert-type scale (1 = *Strongly disagree*; 5 = *Strongly agree*) and has 12 items for each of the factors. Costa and McCrae reported an internal consistency coefficient of $\alpha = .81$ for

conscientiousness. In the current study, the scales showed acceptable reliability; $\alpha = .89$ for neuroticism, $\alpha = .81$ for extroversion, $\alpha = .72$ for openness to experience, $\alpha = .75$ for agreeableness, and $.86$ for conscientiousness.

Procedure

The measures were part of a general survey of students' satisfaction with university services (e.g., administration, library, counselling). The survey was administered online and was open for the 3 months of first semester of the academic year. The survey took no longer than 1 hour to complete, on average. The university's Human Research Ethics Committee approved administration of the survey.

Results

The mean scores for the measures, subdivided by academic discipline, are shown in Table 1. Openness to Experience [$F(5,523) = 6.60, MS = 259.56, p < .001, \eta^2 = .06$], Agreeableness [$F(5,523) = 6.29, MS = 228.86, p < .001, \eta^2 = .06$], and Career Choice Satisfaction [$F(5,523) = 5.49, MS = 164.39, p < .001, \eta^2 = .05$] had means that were significantly different among some of the disciplines, with medium effect sizes. Although these disciplinary differences are not germane to the current study—thus post hoc analyses were not conducted—they are worth noting with respect to formulating future research questions in which discipline is of central concern.

 Insert Table 1

The inter-correlations among the measures are shown in Table 2. Consistent previous research (O'Connor & Paunonen, 2007; Poropat, 2009; Richardson et al., 2012), the correlation between conscientiousness and GPA is the strongest of the personality factors. Similarly, as found in other research (McKenzie & Schweitzer, 2001), there is a small

positive relationship between GPA and generalized self-efficacy, but not quite as strong as that found in other research (Richardson et al., 2012). Again comparing to the results found by Richardson et al. (2012), there was a small positive correlation between optimism and GPA. Moreover, there were moderate positive relationships between the key criterion variable, academic major satisfaction, and conscientiousness, self-efficacy, career choice satisfaction, and optimism, respectively. Together, these results provided prima facie evidence that there were sufficient relationships among the variables to test a structural model.

 Insert Table 2

The specified path models were analysed using IBM SPSS AMOS V18 (Arbuckle, 2009). The first model analysed had minimal constraints, where conscientiousness and self-efficacy were each allowed to correlate with career optimism, career choice status, GPA and academic major satisfaction, respectively. In this model, career optimism predicted career choice status and academic major satisfaction; career choice status predicted academic major satisfaction and GPA, respectively. The path from career choice status to GPA was significant at $p < .05$; all other specified paths were significant at the $p < .001$. The path diagram, including standardised estimates, is shown in Figure 1. The model was tested using maximum likelihood and robust statistics. According to the recommendations by Hu and Bentler (1999), a good fitting model has a $\chi^2/(df) < 3$, GFI $> .95$, and a RMSEA, $.05$. The specified paths represented a good fit for to the data $\chi^2 = .927(2)$ $p = .629$; GFI = $.999$; CFI = 1.00 ; RMSEA $< .001$ ($< .001 - .069$). There were several paths that were not statistically significant, including the paths from conscientiousness to career choice status and academic

major satisfaction; the paths from self-efficacy to career choice status, GPA and academic major satisfaction were also not statistically significant.

 Insert Figure 1

Given the initial strong model fit, there was scope to add more constraints and produce a simpler model by removing some paths. All of the non-significant paths from the first model were removed and the model was retested. The simplified model appears in Figure 2; despite more constraints, the simplified model represented a good fit to the data $\chi^2 = 10.454 (7) p = .164$; Goodness of Fit Index = .993; CFI = .999; RMSEA < .031 (<.001 - .066). With exception of the path between career choice status and GPA which was significant at the $p < .05$ level, all paths were significant at $p < .001$. Career optimism fully mediated the paths from self-efficacy to academic major satisfaction; self-efficacy to career choice status; conscientiousness to academic major satisfaction; and conscientiousness to career choice status. This clearly indicates the influence of optimism on academic major satisfaction. Comparison of the models indicated no significant difference, $\chi^2_{diff}(5) = 9.527, p = .089$; therefore, when taken together with the equivalent results for CFI and GFI, the more parsimonious, simplified model was chosen.

 Insert Figure 2

Discussion

In this paper, we address a specific aspect of student satisfaction, namely satisfaction with academic major. The research reported here demonstrates that optimism predicts

satisfaction with academic major. Importantly, optimism was shown to fully mediate the influence of conscientiousness on satisfaction with academic major.

In the cultural context of this research, quite significant importance is ascribed to the impact of institutional rankings that are synthesised from global indicators of student experience and graduate outcomes, such as the Australian Graduate Survey (AGS; Graduate Careers Australia, 2012) and its Course Experience Questionnaire (CEQ) which addresses graduates' views on the quality of teaching, the employability skills they developed, and the general satisfaction with the degree program. The reputational cache of these surveys that are mandated by the Australian Government is evident in the production of publicly funded resources such as *MyUniversity* (<http://myuniversity.gov.au>) and commercial resources such as the *Good Universities Guide* (<http://www.gooduniguide.com.au>) that aggregate satisfaction data drawn from the AGS. Although the emphasis on student satisfaction is not just an exigency of the Australian higher education system, such pressures upon universities internationally provide good reason to explore the myriad predictors of students' satisfaction with their studies to determine whether career-related variables are part of this picture. The results of the current research provide a fine-grained perspective on student satisfaction that may complement global measures of "overall satisfaction" provided by measures such as the CEQ (Graduate Careers Australia, 2012).

Limitations

Unfortunately, we were unable to secure access to our university's data for the CEQ graduates' measure of satisfaction. Understandably, the CEQ data are commercially sensitive and access is tightly restricted. With the cohort of students who participated in the current study, it would have been informative to cross-reference the separate measures of satisfaction to longitudinally track their satisfaction while as a student (during the current study) and later as a graduate. Doing so would have provided a source of comparative data for psychometric

analysis of the measures used in this study and to determine whether there were changes in satisfaction over time (i.e., upon graduation). Researchers at other institutions may have access to their institutional data on student satisfaction, however, and may be able to conduct such research.

Implications for Theory

This research was conceptually framed by the career construction theory (Savickas, 2005) which posits vocational personality and career adaptability as two dimensions of the psychology of career. This research affirmed that conscientiousness, a facet of vocational personality, is indeed positively associated with career satisfaction. However, the structural model determined in this study supports an assertion that elements of career adaptability, namely optimism, may mediate the impact of conscientiousness on career satisfaction. This is consistent with Savickas' (2005) propositions that the elements of career adaptability are psychological resources that enable a person to flexibly cope and thrive with new challenges. Moreover, the results of this study provide evidence that within the conceptual frame of career adaptability, career optimism has a greater impact upon satisfaction than its companion adaptability element general self-efficacy.

Implications for Practice

The structural model demonstrated in this research may be taken as evidence for the assertion that enhancing students' career optimism will have a positive effect on satisfaction with studies. This is consistent with Seligman's (2011) proposition that optimism can be learned to bring about lasting personal transformation and enhanced engagement in meaningful activities. Accordingly, career optimism may be operationalized as a learning objective for curriculum-integrated career development learning (cf. McIlveen, 2012) or career counseling (cf. Krumboltz, 2009) whereby learning is personally transformative because it takes a student-centered focus.

Future Research

This research involved a representative cross-section of academic disciplines and there was some (unreported) evidence of disciplinary differences on agreeableness, openness to experience, and career choice satisfaction. Although not of importance to the current study, with sufficient numbers of participants in each discipline, it may be possible to conduct a group-wise analysis to test the path models. If it had transpired that the models differed among the disciplines, then one may speculate that measures of occupational type (e.g., Holland's R, I, A, S, E, C) may produce direct or indirect effects additional to those produced by the Big Five factor conscientiousness. Thus, replicating the current study and including a measure of occupational type may provide models that inform discipline-focused research and interventions. Practitioners may proceed to focus on the design and delivery of career interventions that integrate career optimism as a learning objective. However, only experimental or quasi-experimental evaluations of such interventions may provide stronger evidence with respect to career optimism's putative effect on students' satisfaction with their major.

Conclusion

This research presents an alternative perspective on students' satisfaction and engagement with academic major. Whilst it is axiomatic that conscientious students are demonstratively engaged in their learning, we suggest that teachers and researchers also attend to students' optimism for their career as another pathway to fostering engagement in learning. Such engagement may positively influence students' success academically and after graduation.

References

- Brown, S. D., Tramayne, S., Hoxha, D., Telander, K., Fan, X., & Lent, R. W. (2008). Social cognitive predictors of college students' academic performance and persistence: A meta-analytic path analysis. *Journal of Vocational Behavior, 72*(3), 298-308.
- Costa, P. T., & McCrae, R. R. (1992). *Revised neo personality inventory (neo pi-r) and neo five-factor inventory (neo-ffi)*. Odessa, FL: Psychological Assessment Resources.
- De Feyter, T., Caers, R., Vigna, C., & Berings, D. (2012). Unraveling the impact of the Big Five personality traits on academic performance: The moderating and mediating effects of self-efficacy and academic motivation. *Learning and Individual Differences, 22*(4), 439-448. doi: 10.1016/j.lindif.2012.03.013
- Graduate Careers Australia. (2012). Australian Graduate Survey, from <http://www.graduatecareers.com.au>
- Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources.
- Krumboltz, J. D. (2009). The happenstance learning theory. *Journal of Career Assessment, 17*(2), 135-154. doi: 10.1177/1069072708328861
- Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior, 45*(1), 79-122. doi: 10.1006/jvbe.1994.1027
- Lent, R. W., Singley, D. B., Sheu, H.-B., Gainor, K. A., Brenner, B. R., Treistman, D., & Ades, L. (2005). Social cognitive predictors of domain and life satisfaction: Exploring the theoretical precursors of subjective well-being. *Journal of Counseling Psychology, 52*(3), 429-442. doi: 10.1037/0022-0167.52.3.429

- Lent, R. W., Singley, D. B., Sheu, H.-B., Schmidt, J. A., & Schmidt, L. C. (2007). Relation of social-cognitive factors to academic satisfaction in engineering students. *Journal of Career Assessment, 15*(1), 87-97. doi: 10.1177/1069072706294518
- Lewis, D. M., & Savickas, M. L. (1995). Validity of the Career Factors Inventory. *Journal of Career Assessment, 3*(1), 44-56. doi: 10.1177/106907279500300104
- Logue, C. T., Lounsbury, J. W., Gupta, A., & Leong, F. T. L. (2007). Vocational interest themes and personality traits in relation to college major satisfaction of business students. *Journal of Career Development, 33*(3), 269-295. doi: 10.1177/0894845306297348
- McCrae, R. R., & Costa, P. T. (1997). Personality trait structure as a human universal. *American Psychologist, 52*(5), 509-516.
- McCrae, R. R., & Costa, P. T. (2003). *Personality in adulthood: A five-factor theory perspective* (2nd ed.). New York, NY: The Guilford Press.
- McIlveen, P. (2012). Transformative career development learning: Building capacity for self-determination. In P. A. Danaher, L. De George-Walker, R. Henderson, K. J. Matthews, W. Midgley, K. Noble, M. A. Tyler & C. H. Arden (Eds.), *Constructing capacities: Building capabilities through learning and engagement* (pp. 144-159). Newcastle on Tyne, UK: Cambridge Scholars Publishing.
- McKenzie, K., & Schweitzer, R. (2001). Who succeeds at university? Factors predicting academic performance in first year Australian university students. *Higher Education Research & Development, 20*(1), 21-33. doi: 10.1080/07924360120043621
- Nauta, M. M. (2007). Assessing college students' satisfaction with their academic majors. *Journal of Career Assessment, 15*(4), 446-462. doi: 10.1177/1069072707305762

- O'Connor, M. C., & Paunonen, S. V. (2007). Big Five personality predictors of post-secondary academic performance. *Personality and Individual Differences, 43*(5), 971-990. doi: 10.1016/j.paid.2007.03.017
- Peterson, C., & Barrett, L. C. (1987). Explanatory style and academic performance among university freshman. *Journal of Personality and Social Psychology, 53*(3), 603-607. doi: 10.1037/0022-3514.53.3.603
- Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin, 135*(2), 322-338. doi: 10.1037/a0014996
- Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138*(2), 353-387. doi: 10.1037/a0026838
- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin, 130*(2), 261-288. doi: 10.1037/0033-2909.130.2.261
- Rottinghaus, P. J., Day, S. X., & Borgen, F. H. (2005). The Career Futures Inventory: A measure of career-related adaptability and optimism. *Journal of Career Assessment, 13*(1), 3-24. doi: 10.1177/1069072704270271
- Savickas, M. L. (1993). *Career Choice Status Inventory*. Unpublished manuscript. Rootstown, OH: Northeastern Ohio Universities College of Medicine.
- Savickas, M. L. (2005). The theory and practice of career construction. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (pp. 42-70). Hoboken, NJ: John Wiley & Sons.
- Schwarzer, R., & Jerusalem, M. (1995). Generalised Self-Efficacy Scale. In J. Weinmann, S. Wright & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs*. (pp. 35-37). Windsor, UK: NFER-Nelson.

- Schwarzer, R., & Jerusalem, M. (2000). General perceived self-efficacy scale Retrieved May 23 2011, from <http://userpage.fu-berlin.de/~health/selfscal.htm>
- Seligman, M. E. (2011). *Learned optimism: How to change your mind and your life*. North Sydney, Australia: William Heinemann.
- Singley, D. B., Lent, R. W., & Sheu, H.-B. (2010). Longitudinal test of a social cognitive model of academic and life satisfaction. *Journal of Career Assessment, 18*(2), 133-146. doi: 10.1177/1069072709354199
- Solberg Nes, L., Evans, D. R., & Segerstrom, S. C. (2009). Optimism and college retention: Mediation by motivation, performance, and adjustment. *Journal of Applied Social Psychology, 39*(8), 1887-1912. doi: 10.1111/j.1559-1816.2009.00508.x
- Tracey, T. J. G., & Robbins, S. B. (2006). The interest–major congruence and college success relation: A longitudinal study. *Journal of Vocational Behavior, 69*(1), 64-89. doi: 10.1016/j.jvb.2005.11.003
- Valentine, J. C., DuBois, D. L., & Cooper, H. (2004). The relation between self-beliefs and academic achievement: A meta-analytic review. *Educational Psychologist, 39*(2), 111-133. doi: 10.1207/s15326985ep3902_3

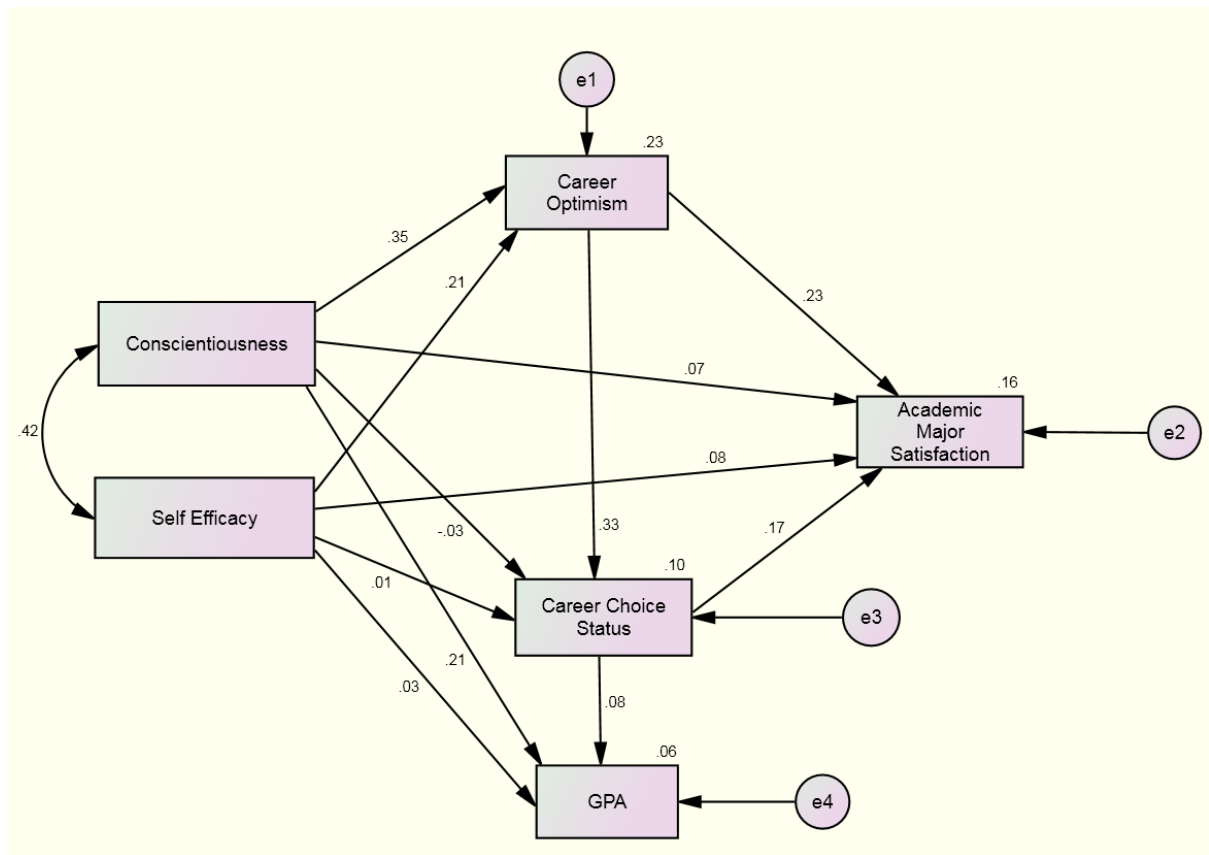


Figure 1. The minimally constrained path diagram for the relationships between the key variables. The numbers next to the arrows indicate the standardized regression weights. The numbers above the items indicate how much of the variance was explained.

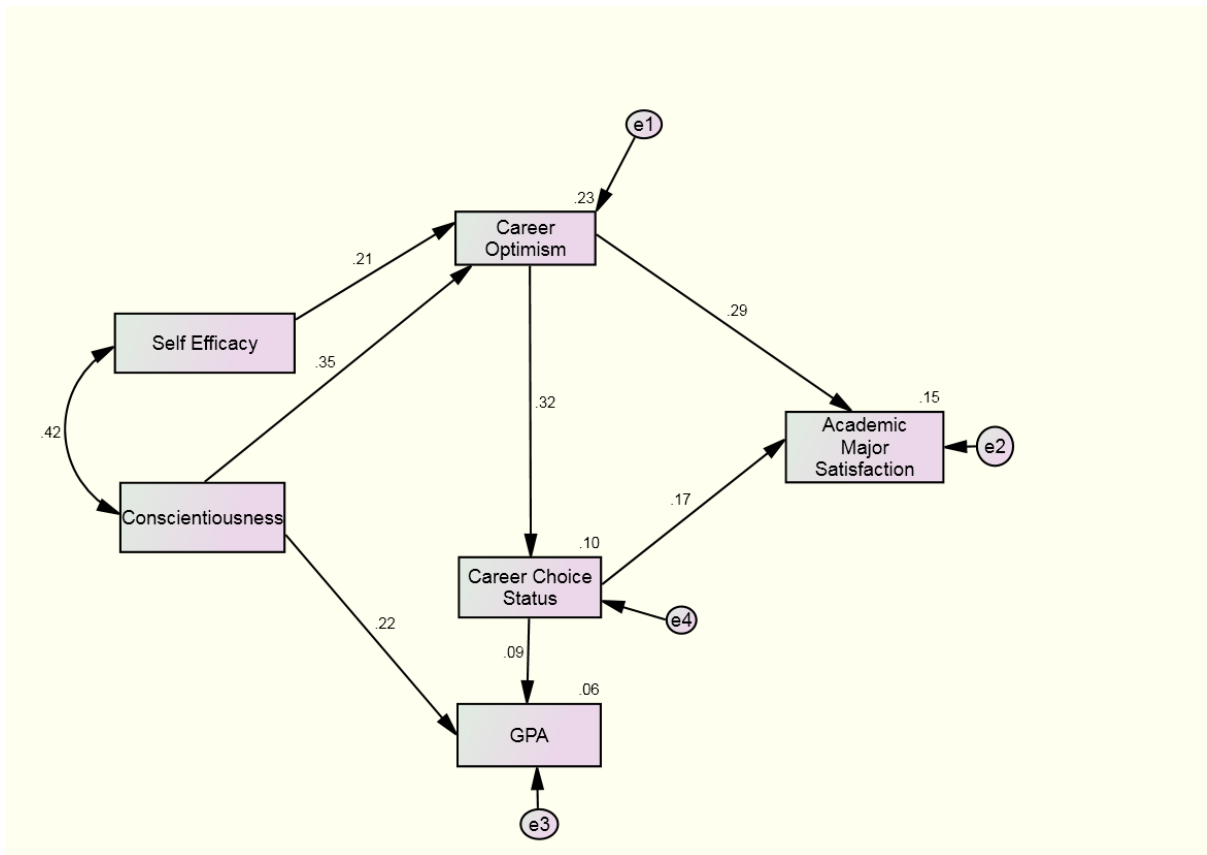


Figure 2. The final path diagram for the relationships between the key variables. The numbers next to the arrows indicate the standardized regression weights. The numbers above the items indicate how much of the variance was explained.

Table 1
 Mean Scores on Measures According to Academic Discipline and All Disciplines Combined

	Academic Discipline													
	Arts		Business		Education		Engineering and Surveying		Sciences		Other		Combined	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
AM	26.7	4.53	27.2	4.24	26.7	4.63	26.9	4.65	27.8	3.83	26.4	3.78	27.1	4.37
SS	1		9		4		1		4		0		1	
CC	22.9	6.45	24.7	5.63	25.5	5.71	27.4	3.72	25.6	5.65	25.4	5.46	25.4	5.58
SI	3		4		6		5		7		0		0	
GS	38.5	4.55	39.7	4.31	39.0	4.56	38.4	4.67	39.2	4.46	39.8	3.35	39.1	4.49
ES	3		4		5		9		9		0		3	
C	45.4	7.54	46.6	6.83	45.8	7.49	44.1	7.21	44.8	8.11	46.4	7.09	45.5	7.42
	4		3		3		9		0		0		2	
A	45.8	5.76	43.8	6.29	46.2	5.88	42.2	6.09	45.0	6.01	40.6	4.67	44.6	6.18
	6		6		8		9		9		0		2	
OE	44.1	6.15	39.6	6.45	42.2	6.21	39.9	5.97	42.5	6.35	40.6	8.35	41.4	6.44
	5		4		8		6		0		0			
E	40.2	6.65	41.7	7.63	42.0	7.23	40.1	6.66	41.4	7.61	42.8	6.14	41.3	7.25
	4		8		5		6		5		0		4	
N	33.0	9.43	32.2	10.3	33.5	8.53	31.6	8.51	33.8	9.90	30.8	10.5	32.8	9.40
	8		8		8		0		3		0		6	
CA	46.7	6.30	48.1	6.20	47.3	6.25	48.2	4.80	47.0	5.93	48.6	3.78	47.6	5.93
	1		3		7		5		4		0		0	
CO	42.0	8.07	42.9	8.04	43.6	8.10	43.5	7.79	43.6	7.98	43.8	12.1	43.2	8.02
	8		1		2		3		3		0		5	
CK	9.86	3.76	10.5	3.09	9.49	3.48	10.2	3.43	9.53	3.47	12.4	2.88	27.1	4.37
			1				6				0		2	

Note. AMSS = Academic Major Satisfaction Scale; CCSI = Career Choice Satisfaction Inventory; GSES = General Self Efficacy Scale; C = Conscientiousness; A = Agreeableness; OE = Openness to Experience; N = Neuroticism; CA = Career Adaptability; CO = Career Optimism; CK = Career Knowledge.

Table 2
Inter-correlations Among Measures

	Measures											
	AMSS	CCSI	GSES	C	A	OE	E	N	CA	CO	CK	GPA
AMSS	1	.26**	.22**	.23**	.12**	.14**	.14**	-.27**	.27**	.35**	.11*	.11*
CCSI	.26**	1	.11**	.11**	.01	.02	.01	-.13**	.21**	.32**	.11*	.11**
GSES	.21**	.11**	1	.42**	.02	.30**	.26**	-.45**	.54**	.36**	.36**	.13**
C	.23**	.11**	.42**	1	.25**	.09*	.26**	-.39**	.43**	.44**	.34**	.23**
A	.12**	.01	.02	.25**	1	.10*	.30**	-.29**	.17**	.12**	.01	.16**
OE	.14**	.02	.30**	.09*	.10*	1	.04	-.08*	.22**	.11*	.17**	.14**
E	.14**	.01	.26**	.26**	.30**	.04	1	-.42**	.36**	.33**	.26**	.02
N	-.27**	-.13**	-.45**	-.39**	-.29**	-.09*	-.42**	1	-.46**	-.37**	-.35**	-.13**
CA	.27**	.21**	.54**	.43**	.17**	.22**	.36**	-.46**	1	.51**	.42**	.12**
CO	.35**	.32**	.36**	.44**	.12**	.11*	.33**	-.37**	.51**	1	.44**	.12**
CK	.11*	.11*	.36**	.34**	.01	.17**	.26**	-.35**	.42**	.44**	1	.07
GPA	.11*	.11**	.13**	.23**	.16**	.14**	.02	-.13**	.12**	.12**	.07	1

Note. ** = $p < 0.01$ level; (2-tailed); * = $p < 0.05$ level (2-tailed).

AMSS = Academic Major Satisfaction Scale; CCSI = Career Choice Satisfaction Inventory; GSES = General Self Efficacy Scale; C = Conscientiousness; A = Agreeableness; OE = Openness to Experience; N = Neuroticism; CA = Career Adaptability; CO = Career Optimism; CK = Career Knowledge.