

Significant predictors associated with the career uncertainty of university students

H. Botha*

e-mail: hannchenbotha@gmail.com

K. Mostert*

WorkWell: Research Unit for Economic and Management Sciences

e-mail: Karina.Mostert@nwu.ac.za

*North-West University, Potchefstroom Campus

Potchefstroom, South Africa

Abstract

The objective of this study was to determine significant predictors of career uncertainty by comparing university students with low and high career uncertainty. A non-probability quota sample ($N = 782$) and cross-sectional design was used. Participants were categorised as either certain ($n = 644$) or uncertain ($n = 135$). These two groups were enclosed as a dependent variable in a logistic regression analysis. In the final step of the logistic regression, significant predictors of career uncertainty were found to be: lack of information about the decision-making process; lack of information about occupations; inconsistent information due to internal conflict; exhaustion ($p \leq 0.01$); lack of information about ways of obtaining information; inconsistent information due to external conflict; cynicism; and lack of dedication ($p \leq 0.05$).

Keywords: career uncertainty, career indecision, core self-evaluation traits, student burnout, student engagement, academic average

INTRODUCTION

Students are often uncertain about their choice of a future career. Uncertainty in making a career choice can lead to an inaccurate decision which can have short- and long-term effects on the individual's quality of life (De Raaf, Dowie and Vincent 2009). Consequently, career uncertainty results in career indecision which influences individuals' approach to and perception of their future career (Elaydi 2006; Jordaan, Smithard and Burger 2009). Career uncertainty can cause additional years of study; delay university graduation (Feldman 2003; Gati and Amir 2010); and lead to more resources (e.g. financial expenses) being needed for students to complete their qualifications (Essig 2010).

Previous research has focused on causes of career uncertainty (Argyropoulou, Sidiropoulou-Dimakakou and Besevegis 2007; Esters 2007); career decision-making difficulties (Amir, Gati and Kleiman 2008; Gati and Amir 2010); and the career decision-making process (Germeijs and Verchuerin 2006; Germeijs, Verchuerin and

Soenens 2006; Salami and Aremu 2007). Further research led to the association of career indecision with personality and situational factors (Jordaan et al. 2009; Khasmohammadi et al. 2010; Page, Bruch and Haase 2008). There is, however, a scarcity of studies that focus on the relationship between career uncertainty and core self-evaluation traits, student burnout, student engagement and academic performance, specifically in the South African context. In South Africa, only a few researchers have investigated the above-mentioned constructs. Creed, Patton and Watson (2003) compared the career uncertainty levels of Australian students with those of South African students; Jordaan et al. (2009) compared students with regard to career uncertainty and work experience; and Mhlongo (2009) and Myburg (2005) studied career decision status and the effects of parental factors.

The objective of this study was therefore to investigate if core self-evaluation traits (self-esteem, self-efficacy, neuroticism); career decision-making difficulties; student burnout; student engagement; and academic performance can predict career uncertainty.

CAREER UNCERTAINTY AND CAREER INDECISION

Career uncertainty and career indecision are directly connected. Jordaan et al. (2009) explain that career uncertainty is a contributing variable which produces career indecision. Career indecision is defined as the difficulty an individual has in the decision-making process and the incapability of making a single choice with regard to his or her career (Gati and Saka 2001). On the other hand, Tien, Lin and Chen (2005, 2) define career uncertainty as 'any factors that make an individual feel uncertain of his/her career future'. Thus, career uncertainty is seen as a causative variable of career indecision because students who experience career uncertainty later develop career indecision which in turn influences their capability of making career decisions (Elyadi 2006). Although the focus of the current study was career uncertainty, the literature reviewed on possible predictors focuses on career uncertainty and career indecision as the constructs are related within the literature.

Career uncertainty and core self-evaluation traits

The study examined the effect of three core self-evaluation traits, including self-esteem, self-efficacy and neuroticism.

Self-esteem is the sum of all the thoughts and emotions individuals have of themselves (Rosenberg 1965). Various studies have found that there is a negative relationship between career indecision and self-esteem (Bacanli 2006; Emanuelle 2009; Saka, Gati and Kelly 2008). According to Tokar, Fischer and Subich (1998), individuals with low self-esteem are inaccurate in evaluating their own capabilities. Low self-esteem also influences individuals to make career decisions that gratify others instead of fulfilling their own needs. These individuals might therefore be hesitant to take part in career exploration and misinterpret information obtained through discovering career options (Callanan and Greenhaus 1992). In line with this,

Hypothesis 1a, therefore, proposed that students who experience career uncertainty will have lower self-esteem compared to students who are certain about their careers.

Self-efficacy is the insight individuals have of their capability of completing tasks under different circumstances (Judge, Locke, Durham and Kluger 1998). The literature suggests that there is a negative relationship between self-efficacy and career indecision (Huang 1997; Krantz 2004; Creed, Prideaux and Patton 2005). According to Betz and Vuyten (1997), students with low self-efficacy are doubtful about setting career goals and are not resilient when they suffer setbacks. In particular, students with low self-efficacy will be unsure of gathering information about career possibilities. Ballout (2009) also found that self-efficacy acts as a moderator between career commitment and career success – individuals with no career commitment and low levels of self-efficacy might therefore have less career satisfaction. Hypothesis 1b, therefore, proposed that students who experience career uncertainty will have lower self-efficacy compared to students who are certain about their careers.

Neuroticism is an individual's tendency to be emotionally sensitive and to over-exaggerate in situations (Eysenck and Eysenck 1968). In various studies researchers have found that neuroticism is related to career indecision (Feldman 2003; Kelly and Pulver 2003; Tokar, Withrow, Halland Moradi 2003). More specifically, neuroticism is associated with problem-solving difficulties and the decision-making style of individuals (Feldman 2003; Tokar et al. 1998). Di Fabio and Palazzeschi (2009) reported that individuals with less neuroticism seem to have fewer difficulties in the decision-making process. Hypothesis 1c, therefore, proposed that students who experience career uncertainty will have higher levels of neuroticism compared to students who are certain about their careers.

Career uncertainty and decision-making difficulties

To identify each individual's unique difficulties in the decision-making process, Gati, Krausz and Osipow (1996) propose a taxonomy of career decision-making difficulties. The taxonomy differentiates between career decision-making difficulties preceding the decision-making process and difficulties that occur throughout the decision-making process. These difficulties are divided into the following three clusters:

- *Lack of readiness*, which includes three categories, namely: lack of motivation; indecisiveness; and dysfunctional beliefs. Lack of motivation reflects lack of willingness to make a decision or to take part in the decision-making process. Indecisiveness is the general difficulty of making decisions and dysfunctional beliefs refers to a distorted perception of the career decision-making process, irrational expectations and dysfunctional thoughts about the decision-making process.
- *Lack of information*, which includes four categories, namely: lack of information about the decision-making process; lack of information about the self; lack of information about occupations; and lack of information about ways of obtaining

information. Lack of information about the decision-making process reflects lack of knowledge about how to make a wise decision and the specific steps involved in the career decision-making process. Lack of information about the self reflects the lack of knowledge an individual has about the self, specifically about career preferences, own abilities and potential. Lack of information about occupations reflects lack of information on the existing range of career options, which alternatives exist and/or what each alternative's characteristics are. Lack of information about ways of obtaining information reflects lack of information about ways of obtaining additional information that may facilitate career decision-making.

- *Inconsistent information*, which consists of three categories, namely: unreliable information; internal conflict; and external conflict. Unreliable information shows that the individual feels that he or she has conflicting information about himself or herself or about the considered occupations. Internal conflict reflects a state of internal confusion that may stem from a difficulty in processing contradictory factors. External conflict reflects a gap between the individual's preferences and the preferences of significant others, or opposing opinions from two significant others (Gati and Osipow 2010).

Gati et al. (1996) suggest that the three most important sources of career indecision are lack of readiness; lack of information; and inconsistent information. Similarly, other researchers report that students experience career uncertainty because of lack of knowledge about themselves, the available careers and the workplace (Feldman 2003; Talib and Aun 2009). Researchers further report that lack of readiness influences individuals' decision status (Mau 2001; Peèjak and Košir 2007; Redwine 2009). Hypothesis 2a, therefore, hypothesised that students who experience lack of readiness when making a career decision will experience more career uncertainty.

In addition, researchers have provided evidence that lack of information leads to career uncertainty (Albion and Fogarty 2005; Mau 2001; Peèjak and Košir 2007). As opposed to this, Mubiana (2010) reported that although students experienced lack of information, they chose a career and were confident about their choice. Hypothesis 2b, therefore, hypothesised that students who experience lack of information when making a career decision will experience more career uncertainty. Finally, researchers have shown that inconsistent information affects students' decision status (Albion and Fogarty 2005; Peèjak and Košir 2007; Redwine 2009). Hypothesis 2c, therefore, proposed that students who experience inconsistent information when making a career decision will experience more career uncertainty.

Career uncertainty and student burnout and engagement

Burnout is experienced when students are physically and emotionally drained due to stress, and when they have a cynical approach towards their studies (Schaufeli, Martínez et al. 2002). Burnout consists of two core components, namely, exhaustion

and cynicism. Exhaustion has often been described as wearing out, loss of energy, depletion, debilitation and fatigue (Maslach, Leiter and Schaufeli 2008, 89). Although exhaustion is often a physical experience, psychological or emotional exhaustion is more often described as being the central experience of burnout. Cynicism refers to a negative shift in responses towards others, negative or inappropriate attitudes towards people, irritability, loss of idealism and withdrawal. Burnout among students refers to a feeling of exhaustion caused by study demands and having a cynical and detached attitude towards their studies (Schaufeli, Martínez et al. 2002).

Reece (2011) found a relationship between high stress levels and career uncertainty. Hinkelman and Luzzo (2007) suggest that psychological distress may intensify career uncertainty, while Tien et al. (2005) found that students experienced physical exhaustion and discouragement while experiencing career uncertainty. Hypothesis 3a, therefore, proposed that students with more career uncertainty will experience higher levels of exhaustion and cynicism compared to students who are certain about their careers.

Engagement is defined as ‘a positive, fulfilling, and work-related state of mind that is characterized by vigour, dedication and absorption’ (Schaufeli, Salanova, González-Romà and Bakker 2002, 75). The study focussed on the two core dimensions of engagement, namely, vigour and dedication (Schaufeli and Bakker 2004). Vigour is defined as high levels of energy and mental resilience while working and by individuals’ willingness and ability to invest effort in their work (Schaufeli, Salanova et al. 2002). Dedication refers to individuals experiencing meaning and satisfaction in their work and being eager and motivated (*ibid.*).

Researchers found that engagement is a sought-after state of university students, and they link engagement to positive academic achievement (Conner 2009). Tien et al. (2005) reported that students felt discouraged while experiencing career uncertainty. Likewise, Konstam and Lehmann (2011) demonstrate that individuals who experience career indecision have considerably lower work engagement. Moreover, students who are sure of their career paths show more engagement to substantiate their decisions (Kosine, Steger and Duncan 2008). Hypothesis 3b, therefore, proposed that students with more career uncertainty will experience lower vigour and dedication compared to students who are certain about their careers.

Career uncertainty and academic performance

In a study conducted by Tien et al. (2005), students reported that low scores on their college admission tests was the cause of career uncertainty. Additionally, the difficulty associated with being accepted by and studying in a specific department (as a result of poor academic performance) might be another reason why students feel uncertain about their career decision (*ibid.*). Hypothesis 4, therefore, proposed that students with lower academic performance will experience more career uncertainty compared to students with higher academic performance.

RESEARCH METHOD

Research design

The study was conducted from a quantitative perspective with a cross-sectional design.

Research participants and procedure

A non-probability quota sample of students at a higher education institution (HEI) was used. Permission to do the research was obtained from the university by writing a letter to the campus registrar and explaining the goals and value of the study. Permission was also obtained from the university's ethical committee to acquire the students' academic records. The data was gathered by having the students complete the questionnaires online via a secure website. The students were assured that participation was voluntary and that the information was confidential. The students signed an informed consent form prior to answering the questionnaire. A realised sample size of 782 was obtained. In total, 91.20 per cent of the participants were white. The majority were female (64.30%), while 59.00 per cent were between the ages of 21 to 29. The academic year was evenly distributed with the Faculty of Theology as the minority (1.30%). A total of 45.40 per cent of the participants had not received career guidance and 25.40 per cent had previous work experience.

Measuring instruments

The following questionnaires were used in the study:

- *Career uncertainty*: This was measured by one item: 'To what extent are you sure about which career you will follow after you leave university?' It comprised four categories: I am very sure; I know exactly which career I will pursue ($n = 228$); I am fairly sure which career I will pursue ($n = 416$); I am not sure at all which career I will pursue ($n = 135$); and I do not plan to follow a career ($n = 3$). Categories one and two were grouped together with participants who were fairly certain which career they would follow, while participants in category three represented participants who were uncertain. Category four was not included as only three participants within that category answered. In total, 644 students were (fairly) certain, while 135 were uncertain. These two groups were used as the dependent variable in the logistic regression.
- *Core self-evaluation traits*: *Self-esteem* was measured with Rosenberg's (1965) Self-Esteem Scale. It consists of ten items (e.g. 'I feel that I have a number of good qualities') and the Cronbach's alpha for self-esteem is 0.88 (Judge, Erez, Bono and Thoresen 2003; Oyler 2007). *Self-efficacy* was measured with the self-efficacy scale (Judge, Locke, Durham and Kluger 1998). It consists of eight items (e.g. 'I am strong enough to overcome life's struggles') and the Cronbach's alpha for self-efficacy is 0.89 (Judge et al. 2003; Oyler 2007). *Neuroticism* was measured with the Eysenck Personality Inventory Neuroticism

scale (Eysenck and Eysenck 1968). It consists of 12 items (e.g. ‘Sometimes I feel miserable for no reason’) and the Cronbach’s alpha for neuroticism is 0.90 (Judge et al. 2003; Oyler 2007). Items for all three scales were scored on a five-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree).

- *Career decision-making difficulties*: The Career Decision-Making Difficulty Questionnaire (CDDQ) (Gati and Saka 2001) was used to measure the difficulties that the students experienced in making career choices. The 34-item version was used which includes three clusters, namely, lack of readiness, lack of information and inconsistent information. Each broad dimension is divided into subscales.
- Lack of readiness includes three subscales, namely: *lack of motivation* (three items, e.g. ‘I know that I have to choose a career, but I don’t have the motivation to make the decision now’); *indecisiveness* (four items, e.g. ‘It is usually difficult for me to make decisions’); and *dysfunctional beliefs* (three items, e.g. ‘I believe there is only one career that suits me’).
- Lack of information contains four subscales, namely: *lack of information about the decision-making process* (three items, e.g. ‘I find it difficult to make a career decision because I do not know what steps I have to take’); *lack of information about the self* (eight items, e.g. ‘I find it difficult to make a career decision because I still do not know which occupations interest me’); *lack of information about occupations* (four items, e.g. ‘I find it difficult to make a career decision because I don’t know what careers will look like in the future’); and *lack of information about ways of obtaining information* (two items, e.g. ‘I find it difficult to make a career decision because I do not know how to obtain additional information about myself’).

Inconsistent information incorporates three subscales, namely: *unreliable information* (six items, e.g. ‘I find it difficult to make a career decision because I constantly change my career preferences’); *internal conflict* (seven items, e.g. ‘I find it difficult to make a career decision because I do not like any of the occupations or training programmes to which I can be admitted’); and *external conflict* (four items, e.g. ‘I find it difficult to make a career decision because people who are important to me do not agree with the career options I am considering’) (Albion and Fogarty 2002).

The items were scored on a nine-point Likert scale ranging from 1 (Does not describe me) to 9 (Describes me well) (ibid.). The reliabilities for the three clusters are: lack of readiness 0.71, lack of information 0.91 and difficulties related to inconsistent information 0.93, while the Cronbach’s alpha for the total scale is reported as 0.94 (Gati et al. 1996).

Student burnout: The Maslach Burnout Inventory-Student Survey (MBI-SS) (Schaufeli, Martínez et al. 2002) was used to measure the participants’ exhaustion and cynicism levels. Exhaustion was measured with five items (e.g. ‘I feel emotionally drained by my studies’) and cynicism with four items (e.g. ‘I have become less

enthusiastic about my studies'). Items were scored on a seven-point frequency rating scale ranging from 0 (Never) to 6 (Always). The MBI-SS has been validated internationally (Schaufeli, Salanova et al. 2002) and in South Africa (Mostert, Pienaar, Gauché and Jackson 2007; Pienaar and Sieberhagen 2005). The reliabilities are 0.79 for exhaustion and 0.73 for cynicism (Pienaar and Sieberhagen 2005). Mostert et al. (2007) found 0.74 for exhaustion and 0.68 for cynicism.

Student engagement: The Utrecht Work Engagement Scale-Student Survey (UWES-S) (Schaufeli, Salanova et al. 2002) was used to measure the participants' vigour and dedication levels. Vigour was measured with five items (e.g. 'When I study, I feel like I am bursting with energy'). Dedication was also measured with five items (e.g. 'I am enthusiastic about my studies'). Items were scored on a seven-point Likert scale ranging from 0 (Never) to 6 (Every day). The UWES-S has been validated internationally (ibid.). In South Africa, Pienaar and Sieberhagen (2005) found reliabilities of 0.77 for vigour and 0.85 for dedication. Mostert et al. (2007) reported a Cronbach's alpha of 0.70 for vigour and 0.78 for dedication.

Academic performance: The participants' academic marks for the first semester were obtained from the academic administration department of the university. The average of the marks was calculated to assess academic performance.

Confirmatory Factor Analysis (CFA) as implemented by means of Mplus 6.1 (Muthén and Muthén 2007) was used to test the factorial validity of the measuring instruments. The input type was the covariance matrix. The robust maximum likelihood estimator was used to accommodate the lack of multivariate normality in the item distribution (ibid.).

Several problematic items were identified for the scales of the three core self-evaluation traits. After repeated analyses, the following items were deemed suitable for further analyses: items 1, 2, 5 and 7 for self-esteem; items 1, 3, 6 and 8 for self-efficacy; and items 2, 3, 4 and 5 for neuroticism. After the problematic items were removed, an acceptable fit was obtained, although the fit could be improved ($\chi^2 = 540.10$, CFI = 0.90 and TLI = 0.87; RMSEA = 0.11). The results supported a three-factor model for career decision-making difficulties ($\chi^2 = 929.48$, CFI = 0.92 and TLI = 0.91; RMSEA = 0.06). However, the communalities of two items of the Lack of Motivation scale (items 2 and 3), one item of the General Indecisiveness scale (item 6), and one item of the Dysfunctional Beliefs scale (item 8) had very low communalities (ranging from 0.16 to 0.20). In addition, the Dysfunctional Beliefs scale did not load onto the higher order Readiness scale. As a result of these problems with the Readiness scale, it was decided only to include the Lack of Information and Inconsistent Information scales in the subsequent analyses. The results supported a four-factor model for student burnout and student engagement. However, five items were problematic (low communalities and cross-loadings) and were discarded from the analysis. These items were exhaustion (item 2), cynicism (item 3 and item 4), vigour (item 2) and dedication (item 5). After these items had been deleted, the results supported a four-factor model for burnout and engagement ($\chi^2 = 284.67$, CFI = 0.95 and TLI = 0.93; RMSEA = 0.06).

STATISTICAL ANALYSIS

The statistical analysis was carried out with the SPSS program (SPSS 2009). Descriptive statistics were used to evaluate the data. Cronbach's alpha coefficients were used to ascertain the internal consistency of the constructs (Clark and Watson 1995). Pearson product-moment correlation coefficients were used to determine the relationship between variables. With regard to statistical significance, it was decided to set the value at a 95 per cent confidence interval level ($p \leq 0.05$). Cut-off points of 0.30 (medium effect), and 0.50 (large effect, Cohen 1988) were set for the practical significance of the correlation coefficients. Direct logistic regression was used to predict if individuals belonged to the career uncertain (coded 0) or the career certain (coded 1) groups.

RESULTS

The results of the descriptive statistics, correlations and reliability of the measuring instruments are provided in Table 1.

Table 1 provides evidence that the Cronbach's alpha coefficients of all the measuring instruments were considered to be acceptable compared to the guideline of $\alpha \geq 0.70$ (Nunnally and Bernstein 1994), demonstrating that all the scales were reliable. All correlations were significant and in the expected direction except for the correlations between neuroticism and vigour and of academic average with lack of information about the decision-making process, lack of information about occupations and inconsistent information due to unreliable information.

Uncertain and certain students were compared for certain socio-demographic characteristics (gender, career guidance, help from parents, help from others, work experience); core self-evaluation traits; career decision-making difficulties; burnout; engagement; and academic performance using χ^2 tests (p -values were obtained from Pearson's chi-square tests) and analysis of variance (ANOVA). Only variables that differed significantly were included in the logistic regression analysis. The results are presented in Table 2.

Table 1 : Descriptive statistics, Cronbach's alpha coefficients (shown on the diagonal) and correlations

Item	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Self-esteem	4.31	0.72	0.83													
2 Self-efficacy	4.19	0.72	0.62**	0.79												
3 Neuroticism	2.75	1.11	-0.31**	-0.30**	0.90											
4 Lack of info about the DM process	4.04	2.29	-0.26**	-0.29**	0.22**	0.91										
5 Lack of info about the self	3.39	1.99	-0.33**	-0.35**	0.25**	0.72**	0.87									
6 Lack of info about occupations	4.03	2.32	-0.21**	-0.24**	0.18**	0.74**	0.78**	0.90								
7 Lack of info about ways of obtaining info	3.47	2.13	-0.29**	-0.29**	0.18**	0.70**	0.76**	0.79**	0.79							
8 Inconsistent info due to unreliable info	3.17	1.89	-0.24**	-0.27**	0.21**	0.62**	0.73**	0.68**	0.71**	0.80						
9 Inconsistent info due to internal conflict	3.37	1.78	-0.27**	-0.29**	0.21**	0.59**	0.69**	0.64**	0.64**	0.73**	0.81					
10 Inconsistent info due to external conflict	2.65	1.98	-0.24**	-0.27**	0.16**	0.39**	0.51**	0.44**	0.48**	0.56**	0.60**	0.81				
11 Exhaustion	2.92	1.39	-0.24**	-0.24**	0.23**	0.26**	0.28**	0.23**	0.25**	0.25**	0.30**	0.25**	0.82			
12 Cynicism	2.14	1.47	-0.29**	-0.29**	0.16**	0.34**	0.40**	0.31**	0.35**	0.37**	0.43**	0.39**	0.67**	0.78		
13 Vigour	3.63	1.28	0.28**	0.24**	-0.06	-0.23**	-0.21**	-0.21**	-0.22**	-0.19**	-0.24**	-0.14**	-0.33**	-0.26**	0.82	
14 Dedication	4.52	1.25	0.37**	0.32**	-0.13**	-0.32**	-0.37**	-0.30**	-0.32**	-0.31**	-0.39**	-0.29**	-0.41**	-0.52**	0.67**	0.88
15 Academic average	65.03	10.32	0.13**	0.11**	0.03	-0.06	-0.08*	-0.04	-0.08*	-0.07	-0.12**	-0.16**	-0.17**	-0.19**	0.18**	0.23**

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

≥ 0.15 is statistically significant; ≥ 0.30 is practically significant (medium effect); ≥ 0.50 is practically significant (large effect)

Table 2: Logistic regression models predicting certainty and uncertainty

Model	Predictor	β	SE β	Wald's χ^2	df	p	e^{β}	95% CI for e^{β}
1	Constant	-1.37	0.10	174.83	1	0.00	0.25	
	Work experience	0.91	0.27	11.54	1	0.00*	0.40	(0.24 - 0.68)
	Overall model evaluation	Cox & Snell R^2	Nagelkerke R^2	χ^2	df	p		
	Likelihood ratio test	0.02	0.03	701.74	1	0.00		
	Hosmer & Lemeshow			0.00	0	.		
2	Constant	0.96	0.75	1.64	1	0.20	2.62	
	Work experience	-0.85	0.27	9.81	1	0.00*	0.43	(0.25 - 0.73)
	Self-esteem	-0.39	0.16	6.06	1	0.01*	0.68	(0.50 - 0.90)
	Self-efficacy	-0.23	0.16	1.94	1	0.16	0.80	(0.58 - 1.10)
	Neuroticism	0.09	0.09	0.83	1	0.36	1.09	(0.91 - 1.31)
	Overall model evaluation	Cox & Snell R^2	Nagelkerke R^2	χ^2	df	p		
	Likelihood ratio test	0.05	0.08	676.89	3	0.00		
	Hosmer & Lemeshow			5.82	8	0.67		
3	Constant	-2.66	0.96	7.61	1	0.01	0.07	
	Work experience	-0.46	0.30	2.28	1	0.13	0.64	(0.35 - 1.15)
	Self-esteem	-0.36	0.18	3.86	1	0.05*	0.70	(0.49 - 1.00)
	Self-efficacy	-0.08	0.19	0.20	1	0.65	0.92	(0.64 - 1.32)
	Neuroticism	-0.14	0.11	1.75	1	0.19	0.87	(0.70 - 1.07)
	Lack of info about the DM process	0.28	0.07	14.80	1	0.00*	1.32	(1.15 - 1.52)
	Lack of info about the self	0.11	0.09	1.52	1	0.22	1.12	(0.94 - 1.34)
	Lack of info about occupations	0.31	0.08	14.25	1	0.00*	1.37	(1.16 - 1.60)
	Lack of info about ways of obtaining info	-0.20	0.08	5.68	1	0.02*	0.82	(0.69 - 0.96)

Model	Predictor	β	SE β	Wald's χ^2	df	p	e^{β}	95% CI for e^{β}
	Inconsistent info due to unreliable info	0.04	0.09	0.18	1	0.67	1.04	(0.88 - 1.23)
	Inconsistent info due to internal conflict	0.30	0.09	10.12	1	0.00*	1.35	(1.12 - 1.61)
	Inconsistent info due to external conflict	-0.13	0.07	4.01	1	0.05*	0.88	(0.77 - 1.00)
	Overall model evaluation	Cox & Snell R^2	Nagelkerke R^2	χ^2	df	p		
	Likelihood ratio test	0.21	0.35	534.31	7	0.00		
	Hosmer & Lemeshow			6.00	8	0.65		
4	Constant	-2.81	1.02	7.62	1	0.01	0.06	
	Work experience	-0.51	0.31	2.77	1	0.10	0.60	(0.33 - 1.10)
	Self-esteem	-0.34	0.18	3.45	1	0.05*	0.71	(0.50 - 1.02)
	Self-efficacy	-0.05	0.19	0.06	1	0.81	0.96	(0.66 - 1.38)
	Neuroticism	-0.12	0.11	1.13	1	0.29	0.89	(0.71 - 1.11)
	Lack of info about the DM process	0.28	0.07	14.92	1	0.00*	1.32	(1.15 - 1.53)
	Lack of info about the self	0.09	0.09	0.89	1	0.35	1.09	(0.91 - 1.31)
	Lack of info about occupations	0.33	0.08	15.63	1	0.00*	1.39	(1.18 - 1.64)
	Lack of ways of obtaining info	0.20	0.09	5.54	1	0.02*	0.82	(0.69 - 0.79)
	Inconsistent info due to unreliable info	0.03	0.09	0.12	1	0.73	1.03	(0.87 - 1.22)
	Inconsistent info due to internal conflict	0.27	0.09	7.95	1	0.01*	1.30	(1.08 - 1.57)
	Inconsistent info due to external conflict	-0.17	0.07	6.38	1	0.01*	0.84	(0.74 - 0.96)
	Exhaustion	-0.28	0.12	5.08	1	0.02*	0.76	(0.59 - 0.96)

Model	Predictor	β	SE β	Wald's χ^2	df	p	e^β	95% CI for e^β
	Cynicism	0.40	0.12	11.17	1	0.00*	1.49	(1.18 - 1.89)
	Overall model evaluation	Cox & Snell R^2	Nagelkerke R^2	χ^2	df	p		
	Likelihood ratio test	0.22	0.37	522.97	2	0.00		
	Hosmer & Lemeshow			8.41	8	0.40		
5	Constant	-0.74	1.09	2.55	1	0.11	0.18	
	Work experience	-0.45	0.31	2.07	1	0.15	0.65	(0.34 - 1.18)
	Self-esteem	-0.19	0.20	0.92	1	0.34	0.83	(0.56 - 1.22)
	Self-efficacy	0.01	0.19	0.00	1	0.97	1.01	(0.69 - 1.47)
	Neuroticism	-0.08	0.11	0.45	1	0.50	0.93	(0.74 - 1.16)
	Lack of info about the DM process	0.27	0.07	13.29	1	0.00*	1.31	(1.13 - 1.52)
	Lack of info about the self	0.08	0.10	0.75	1	0.39	1.09	(0.90 - 1.31)
	Lack of info about occupations	0.32	0.09	14.10	1	0.00*	1.38	(1.17 - 1.63)
	Lack of ways of obtaining info	-0.21	0.09	5.63	1	0.02*	0.81	(0.69 - 0.97)
	Inconsistent info due to unreliable info	0.05	0.09	0.35	1	0.56	1.05	(0.89 - 1.26)
	Inconsistent info due to internal conflict	0.24	0.10	6.20	1	0.01*	1.27	(1.05 - 1.53)
	Inconsistent info due to external conflict	-0.15	0.07	5.09	1	0.02*	0.86	(0.75 - 0.98)
	Exhaustion	-0.32	0.13	6.04	1	0.01*	0.73	(0.57 - 0.94)
	Cynicism	0.31	0.13	5.56	1	0.02*	1.36	(1.05 - 1.76)
	Vigour	-0.13	0.12	1.07	1	0.30	0.88	(0.69 - 1.12)
	Dedication	-0.27	0.14	4.14	1	0.04*	0.76	(0.58 - 0.99)
	Overall model evaluation	Cox & Snell R^2	Nagelkerke R^2	χ^2	df	p		
	Likelihood ratio test	0.23	0.32	510.08	2	0.00		
	Hosmer & Lemeshow			3.55	8	0.90		

Model	Predictor	β	SE β	Wald's χ^2	df	p	e^{β}	95% CI for e^{β}
6	Constant	-1.55	1.62	1.51	1	0.22	0.21	
	Work experience	-0.44	0.32	1.99	1	0.16	0.64	(0.35 - 1.19)
	Self-esteem	-0.19	0.20	0.89	1	0.35	0.83	(0.57 - 1.22)
	Self-efficacy	0.01	0.19	0.00	1	0.97	1.01	(0.69 - 1.47)
	Neuroticism	-0.07	0.11	0.43	1	0.52	0.93	(0.74 - 1.16)
	Lack of info about the DM process	0.27	0.07	13.32	1	0.00*	1.31	(1.13 - 1.52)
	Lack of info about the self	0.08	0.10	0.75	1	0.39	1.09	(0.90 - 1.31)
	Lack of info about occupations	0.32	0.09	14.13	1	0.00*	1.38	(1.17 - 1.63)
	Lack of info about ways of obtaining info	-0.21	0.09	5.67	1	0.02*	0.81	(0.68 - 0.96)
	Inconsistent info due to unreliable info	0.05	0.09	0.36	1	0.55	1.06	(0.89 - 1.26)
	Inconsistent info due to internal conflict	0.24	0.10	6.16	1	0.01*	1.27	(1.05 - 1.53)
	Inconsistent info due to external conflict	-0.16	0.07	5.15	1	0.02*	0.86	(0.75 - 0.98)
	Exhaustion	-0.32	0.13	6.07	1	0.01*	0.73	(0.57 - 0.94)
	Cynicism	0.31	0.13	5.50	1	0.02*	1.36	(1.05 - 1.76)
	Vigour	-0.12	0.12	0.99	1	0.32	0.88	(0.69 - 1.13)
	Dedication	-0.27	0.14	4.09	1	0.04*	0.76	(0.58 - 0.99)
	Academic average	0.00	0.01	0.08	1	0.77	1.00	(0.97 - 1.02)
	Overall model evaluation	Cox & Snell R^2	Nagelkerke R^2	χ^2	df	p		
	Likelihood ratio test	0.23	0.39	510.00	1	0.77		
	Hosmer & Lemeshow			2.48	8	0.96		

Note: All statistics are presented for all variables in the logistic regression equations. For Model 1. Cox and Snell $R^2 = 0.02$ and Nagelkerke $R^2 = 0.03$; for Model 2 Cox and Snell $R^2 = 0.05$ and Nagelkerke $R^2 = 0.08$; for Model 3 Cox and Snell $R^2 = 0.21$ and Nagelkerke $R^2 = 0.35$; for Model 4. Cox and Snell $R^2 = 0.22$ and Nagelkerke $R^2 = 0.37$; for Model 5 Cox and Snell $R^2 = 0.23$ and Nagelkerke $R^2 = 0.32$; for Model 6 Cox and Snell $R^2 = 0.23$ and Nagelkerke $R^2 = 0.39$

As demonstrated in Table 2, after adjusting for all the variables, lack of information about the decision-making process; lack of information about occupations; lack of information about ways of obtaining information; inconsistent information due to internal conflict; inconsistent information due to external conflict; exhaustion; cynicism; and dedication were predictive of career uncertainty. Hypotheses 2b, 2c, 3a were, therefore, accepted. However, only dedication was a significant predictor in the logistic regression models. Therefore, Hypothesis 3b was partially accepted. No support was found for Hypotheses 1a, 1b, 1c, 2a and 4.

DISCUSSION

In the current study, logistic regression analysis was used to determine if core self-evaluation traits (self-esteem, self-efficacy, neuroticism); career decision-making difficulties; student burnout; student engagement; and academic performance can predict career uncertainty.

All three core self-evaluation traits (self-esteem, self-efficacy and neuroticism) were significant in the ANOVA analysis. However, only self-esteem was a significant predictor of career uncertainty in the earlier steps of the logistic regression model. However, since it was not a significant predictor in the final step, it seems that self-esteem influences career uncertainty only to some degree as the role of self-esteem diminished when the other predictors were entered into the model.

The career decision-making difficulties consist of the three clusters, namely: lack of readiness; lack of information; and inconsistent information. Because of poor validity, the lack of readiness cluster was not included in subsequent analyses. The following categories of lack of information were significant predictors of career uncertainty: lack of information about the decision-making process; lack of information about occupations; and lack of information about ways of obtaining information. Therefore, when individuals experience a lack of information about the decision-making process, they have limited knowledge about the steps involved in making a decision. They may have trouble combining information about themselves (core self-evaluation traits, interests, abilities) and possible career options (subjects, abilities, training required). This could then lead to career uncertainty. Furthermore, when individuals experience lack of information about occupations, it reveals that they are unaware of possible career options. Individuals could either be uninformed about different areas of work within an occupational field or they are unsure what career alternatives involve, which leaves them uncertain about specific options. Lack of information about ways of obtaining information reflects that individuals have limited information that will help the decision-making process (e.g. where to find a career guidance counsellor), and this can intensify career uncertainty (Gati and Osipow 2010). These findings are supported by previous research on the broad dimensions of career decision-making, which found that lack of information influences individuals' decision status (Albion and Fogarty 2005). Pečjak and Košir (2007) found that uncertain students experience lack of information during the

decision-making process. Mau (2001) also found that lack of information has a great impact on career indecision.

The categories of inconsistent information that were significant in the logistic regression analysis were internal conflict and external conflict. Inconsistent information due to internal conflict relates to individuals who experience confusion because there is opposing information (e.g. training for the individual's study preference is far from home). In addition, inconsistent information due to external conflict occurs when significant others influence the individual (e.g. the students' preference for the institution differs from that of their parents). These factors could lead individuals to become uncertain of their future careers (Gati and Osipow 2010). This links with Redwine's (2009) finding that students who changed their major subject had inconsistent information in the decision-making process. Albion and Fogarty's (2005) and Peejak and Košir's (2007) findings also suggest that inconsistent information affects students' decision status.

With regard to burnout and engagement, exhaustion, cynicism and dedication were significant predictors of career uncertainty in the final step of the model. When students experience exhaustion, they are physically and/or emotionally exhausted from their studies which influences their career decidedness. This finding is supported by Hinkelman and Luzzo (2007), who suggest that psychological distress might increase career uncertainty, and Tien et al. (2005), who found that students experience exhaustion when they feel uncertain about their career choice. Cynicism develops when students have no optimism and withdraw from their work. The stress that students experience from their studies leads to discouragement, which in turn could influence their decision status. This assertion is supported by Tien et al. (2005), who found that students experience cynicism when they feel uncertain about their career. Finally, dedication occurs when students are motivated towards their studies; the results indicate that a lack of dedication might lead to career uncertainty. This is supported by Tien et al.'s (2005) finding that students feel discouraged while experiencing career uncertainty. The finding that dedication is associated with career uncertainty is also supported by Konstam and Lehmann (2011), who found that individuals who experience career indecision have lower work engagement.

LIMITATIONS AND RECOMMENDATIONS

The current study had several limitations. The first limitation was that the research sampling method used was a non-probability quota sample. Therefore, the results cannot be generalised to a larger population and might not be true for all individuals. Secondly, a cross-sectional design was used (Fogarty and McGregor-Bayne 2008; Kelly and Shin 2008); therefore, causality of the relationship between the predictors and career uncertainty could not be determined. Thirdly, the study focused entirely on a student sample from one specific university (Amir and Gati 2006; Redwine 2009), which implies difficulty in generalising the results to other universities or the organisational context. Furthermore, the study sample was racially homogeneous

(Gati and Amir 2010; Nauta 2011), which means that the results might not be true for all individuals within the South African context.

It is recommended for future research that longitudinal research be conducted to determine the effects of career uncertainty and whether the predictors included in this study could rather be outcomes of career uncertainty. This study focused on only two of the three dimensions of career decision-making difficulties, namely, lack of information and inconsistent information. Future research concerning the minimisation of career uncertainty and career indecision can be done on the validity of the other dimension (lack of readiness), and it can explore what students find useful for minimising career decision-making difficulties they experience regarding lack of readiness, lack of information and inconsistent information. Possible reasons for the poor functioning of items of this scale should also be explored. Although the results did not find that core self-evaluation traits (self-esteem, self-efficacy and neuroticism) were significantly related to career uncertainty, it is recommended that future studies should continue to investigate the relationship as previous research has reported on the association between the variables (Bacanli 2006; Creed et al. 2005; Kelly and Pulver 2003). Furthermore, since several items were problematic and only four items per scale were used in the analysis, the results pertaining to the core self-evaluation traits should be interpreted with caution. Future research should examine possible reasons for underlying problems and investigate the validity of other scales measuring core self-evaluation traits that are suitable for students.

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