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A Short-Form of the Career Futures Inventory[1]

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Abstract

The purpose of this study was to test the international transferability and structural validity of the Career Futures Inventory (CFI; Rottinghaus, Day, & Borgen, 2005) in a sample of Australian university students ($N = 1,566$). Exploratory factor analysis of the data from a random half-split of the sample supported a three-factor solution equivalent to the original CFI subscales, Career Optimism, Career Adaptability, and Perceived Knowledge. Confirmatory factor analysis of the data from the remaining random half-split supported the structural validity of a short-form, the CFI-9. The subscales of the CFI-9 had acceptable internal consistencies and correlations with measures of academic major satisfaction, career choice satisfaction, and self-efficacy. It was concluded that the properties of the CFI and the CFI-9 were sufficient to explore their application as measures of perceptions of employability. It was suggested that the CFI-9 has potential as a diagnostic screening tool for counseling or educational interventions.

Keywords: Career Futures Inventory, short-form, CFI-9, employability, optimism, adaptability

A Short-Form of the Career Futures Inventory

The research reported in this paper occurred within a context of increasing pressure by government and industry upon universities to address graduate *employability* and the development of *graduate attributes*. Employability is a complex, multidimensional construct (Fugate, Kinicki, & Ashforth, 2004). Subjectively experienced or objectively observed, employability can be taken a key latent indicator of the performance of graduates as individuals and educational institutions. Yet, it is a contested construct within the higher education sector because of a lack of shared understanding of its meaning amongst academic communities (Yorke, 2006). Within the field of higher education, employability may be conceived of as "a set of achievements—skills, understandings and personal attributes—that makes graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy" (Yorke, 2006, p. 8). Thus, employability is the potential for employment; it is not employment per se. In other words, completing a degree in a particular discipline presents a graduate with the potential to enter a particular professional field related to that discipline; however, it does not guarantee entry in the form of employment in a specific occupation typical of that discipline.

A related construct, *graduate attributes,* is similarly complex and not uniformly understood in the academic community and articulated in curricula (Green, Hammer, & Star, 2009). Graduate attributes are those qualities that are developed directly and indirectly through the curricula of degree programs and specific disciplines, and that represent learning outcomes that can be distinguished from disciplinary content per se, and can be developed in any number of disciplines (Higher Education Academy, 2006). *Career self-management* (Bridgstock, 2009) is an overarching graduate attribute under which all other graduate attributes can be directed toward the purpose of fulfilling an individual's career aspirations, learning, and employability. Accordingly, in this paper we address aspects of the psychometric measurement of the self-perception of personal qualities of career self-management and the theoretical notion of employability given in a particular theoretical model (Fugate, et al., 2004).

Fugate, Kinicki, and Ashforth's (2004) conceptual model of employability comprises three hypothesised factors: *career identity*; *personal adaptability*; and *social capital* and *human capital*. Career identity represents the long-term meaning-making that underpins a sense of personal identity—personal construction of past and present experiences, and future sense of becoming. It entails an individual's self-referent meaning-making that contributes to key life-effecting decisions (e.g., wanting to complete a degree in order to enter a particular profession). Personal adaptability comprises optimism, that enables individuals to confront and engage with the need for change; a propensity to engage in learning; openness to experience, flexibility in moments of change; an internal locus of control, that centres the individual on their capacity to make decisions for themselves; and a general sense of self-efficacy as a global attitude of being able to take on challenges and succeed. Social capital refers to an individual's interpersonal networks and access to information and resources through those networks. Human capital refers to education, training, and professional experiences that are demanded in the workforce generally and in workplaces specifically.

Perceptions of Employability

The three hypothesised factors of employability—career identity (e.g., career decidedness), personal adaptability (e.g., self-efficacy, personality traits, general mental

abilities), and social and human capital—are subject to change. Indeed, Fugate et al. (2004) emphasised the personal malleability necessary for employability: (a) that an individual has little or no control over the criteria used by employers to make employment decisions, and (b) that individuals have more control over their personal qualities that contribute to employability. As higher education practitioners we acknowledge the salience of relatively stable traits and general mental abilities; however we are interested in the psychological— cognitive, behavioural, and emotional—aspects of students' perceptions of their employability that are amenable to the curriculum and within the scope of extra-curricular interventions supplied by universities to their students (e.g., career counselling, career education, and career information). According to Rottinghaus et al. (2005) "optimistic and adaptable people appear to strive higher academically, report greater comfort with their educational and career-related plans, and engage in activities that advance their level of career insight" (Rottinghaus, et al., 2005, p. 20). Thus, we selected the Career Futures Inventory (CFI; Rottinghaus, et al., 2005) as a potential tool to measure individuals' perceptions of the factors that constitute employability.

The CFI is a 25-item measure of three factors of career self-management: Career Adaptability (CA, 11 eleven items), Career Optimism (CO, 11 items) and Perceived Knowledge of the employment market (PK, 3 items).   Rottinghaus et al. (2005) defined CA as "the way an individual views his or her capacity to cope with and capitalise on change in the future, level of comfort with new work responsibilities, and ability to recover when unforseen events alter career plans" (p. 11); CO as "a disposition to expect the best possible outcome or to emphasise the most positive aspects of one's future career development, and comfort in performing career planning tasks" (p. 11); and PK as "perceptions of how well and individual understands job market and employment trends" (p. 11). Respondents indicate their agreement with each item using a 5-point Likert-type scale (1 = *Strongly disagree;* 5 = *Strongly agree*).

There is broad conceptual alignment of the three factors of career self-management (CA, CO, and PK, Rottinghaus et al., 2005) with the three factors of employability (career identity, personal adaptability, and social and human capital; Fugate et al., 2004). It is conceivable that items from the CA will load with measures of personal adaptability (e.g., I can adapt to change in the world-of-work), items from CO will load with measures of career identity (e.g., I am eager to pursue my career dreams), and items from PK will load with measures of social and human capital, not directly in terms of actual networks and skills per se, rather in terms of reflective self-awareness and the requirements in the labour market (e.g., I am good at understanding the job market trends). Just as the employability model depicts overlap between its three factors, there is correspondence between CA, CO, and PK evidenced in their statistical correlations with one another. Also, we do not posit pure, orthogonal relationships between CA and personal adaptability, CO and career identity, and PK and capital. There must be some degree of shared loading. For example, CA may have conceptual relationships with personal adaptability, however, CA is also likely to correlate with career identity. The same principles apply for the other factors in terms of conceptual correspondence.

The broader context of this study was to explore the potential for the CFI to act as a partial measure for dimensions of the employability model of Fugate et al. (2004), as it is understood and applied to university students and graduates. Specifically, we sought to (a) determine the CFI's international transferability by testing its three-factor structure in an Australian sample of university students, and (b) explore its validity by comparing it with

measures that may be taken as indicators of career self-management as a graduate attribute: career decidedness and satisfaction, engagement with studies, and generalised self-efficacy. Furthermore, as there is an increased focus on brief or single session career counseling there is a need to find and develop affordable and accessible brief or short form tests that can be applied as screening tools. Short forms have the advantage of the counsellor or researcher assessing multiple constructs in a single session (Patton & McIlveen, 2009), and may not have the redundancy of longer instruments yet maintain adequate reliability and validity (Dreer et al., 2009).

Method

Participants

This study involved 1566 students enrolled at the University of XXX. The University of XXX is a multi-campus institution with campus sites in metropolitan and regional Australia. It also has a significant proportion of students who are from a rural/regional background, low socio-economic status, or taking their degrees by distance education (ANONYMOUS CITATION). The average age of the sample in this study was $M = 33.25$ years ($SD = 11.47$). The original validation study of the CFI (Rottinghaus, et al., 2005) did not report the average age of its sample. The two-thirds/one-third female to male gender split in this study was similar to the original validation study: 1041 (66.5%) were female and 525 (33.5%) male. Thirty-four (2.2%) identified as Indigenous Australians, and 90 (5.7%) identified English as a second language. The proportion of disciplines by academic department was: arts 196 (12.5%); business 414 (26.4%); education 367 (23.4%); engineering and surveying 244 (15.6%); and sciences 331 (21.1%). A total of 14 (0.90%) did not identify with an academic department or were part of a non-award program (e.g., single course professional development studies). The relative proportions of disciplines in this sample aligned with the overall institutional proportions. Participants provided information on their employment: hours of work currently per week to determine present status; and years of employment if they had been in employment since leaving high school. On average, the participants worked 31.2 ($SD = 12.96$) hours per week. On average, the participants had been working for 8.50 ($SD = 7.30$) years. These summary statistics are consistent with the student profile of the university (i.e., the majority taking part-time studies while working). First-year students comprised almost one-third (29.7%) of the sample.

The overall sample was then randomly divided into two equal subsamples (n = 783). Exploratory Factor Analysis (Principal Components Analysis) was performed on the data set from the first subsample to reduce the overall number of items in the CFI. Confirmatory Factor Analysis was performed on the second subsample to test the construct and criterion validity. There were no differences between the two subsamples for age (Group 1 $M = 33.06$, $SD = 11.62$; Group 2 $M = 33.45$, $SD = 11.32$) and gender. Visual inspection of frequencies also demonstrated the two subsamples were similar for proportion of disciplinary courses completed.

Measures

Career Futures Inventory (CFI). The initial validation of the CFI (Rottinghaus, et al., 2005) on a sample of North American undergraduate students reported an exploratory factor analysis in which the three hypothesised factors accounted for 40% of the variance. Confirmatory factor analysis found a good fit to the three factor model. Mean scores and internal consistencies reported in the original validation study were: $M = 41.63$, $SD = 5.41$, $\alpha = .85$ for CA; $M = 37.62$, $SD = 7.35$, $\alpha = .87$ for CO; and $M = 9.20$, $SD = 2.13$, $\alpha = .73$ for PK. The study also found relationships between the CFI scales and psychometric measures of

positive affect (i.e., morale) and negative affect (i.e., distress), problem-solving, big-five personality dimensions (i.e., neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness), and measures of skills and confidence for occupational interests. The patterns of correlations amongst the subscales and these other measured variables were taken as evidence for the CFI's validity. With regard to the previously stated assumption of overlap between the CFI subscales and their corresponding employability factor, we inspected the results drawn from the personality scale reported by Rottinghaus et al., because personality traits are stable or enduring. Rottinghaus et al. found that CA and CO had equivalently moderate to large positive correlations with the personality traits of conscientiousness (.41 and .51, respectively) and small to moderate correlations with openness to experience (.26 and .23, respectively). Also, there were equivalently small to moderate negative correlations between neuroticism and CA (-.30), CO (-.29), and PK (-.22), respectively.

Career Choice Status Inventory (CCSI). The CCSI (Savickas, 1993) is a six-item measure of satisfaction with choice pertaining to career field, academic major and occupational choices (e.g., I have chosen the occupation that I want to enter; I have a specific occupation in mind). Respondents indicate their satisfaction on a Likert-type scale of 1 (*Very dissatisfied and intend to change*) to 5 (*Well satisfied with choice*). This scale has been used in other validation studies (e.g., Lewis & Savickas, 1995). The theoretical range of scores is 6 to 30.

Academic Major Satisfaction Scale (AMSS). The AMSS (Nauta, 2007) is a six-item measure of career satisfaction with regard to studies (e.g., I often wish I hadn't gotten into this major; I wish I was happier with my choice of an academic major). Respondents indicate their satisfaction on a Likert-type scale of 1 (*Strongly disagree*) to 5 (*Strongly agree*). The theoretical range of scores is 6 to 30.

General Self-Efficacy Scale (GSES). The GSES (Schwarzer & Jerusalem, 1995) was a 10-item measure of sense of mastery across a variety of situations (e.g., Thanks to my resourcefulness, I can handle unforeseen situations; I am certain I can accomplish my goals). Respondents indicate their confidence on a Likert-type scale of 1 (*Strongly disagree*) to 5 (*Strongly agree*). The theoretical range of scores for this scale is 10 to 50. Whilst we accept the proposition that self-efficacy is specific to certain behavioural domains and that it is not a general construct (Lent & Brown, 2006), we retained the term self-efficacy to be consistent with the title of the scale and interpreted the scale as a measure of general confidence.

Results

Exploratory Factor Analysis

The data were factorable with Kaiser-Meyer-Olkin measure of sampling at .92 and Bartlett's Test of Sphericity; $\chi^2 = 10079$, df = 300, $p < .000$. An exploratory factor analysis with oblique (Oblimin) rotation was used because it was assumed that the three hypothesised factors are interrelated. A forced three-factor solution converged at six rotations and accounted for 52.92% of the variance. The pattern matrix is shown in Table 1. A four-factor solution accounted for 58.61%; however we retained the original three-factor solution as this study was a test of the transferability of the original scale and model, and the additional variance of a four-factor solution was not considered sufficient reason to amend the model. In the validation study Rottinghaus et al. (2005) the CFI accounted for 40% of the variance, whereas in this study it accounted for approximately 53%. Rottinghaus et al. found that CA was the predominant factor, accounting for 24.89% of the variance, followed by CO accounting for 10.09%, then PK at 4.62%. Loadings found in the current study, as shown in

Table 1, indicated a reversal of CO and CA, with the first factor CO accounting for a larger proportion of the variance (one-third as distinct from one quarter). PK was slightly higher too. Values under .32 were supressed in order to aid in the ease of interpretation (Tabachnick & Fidell, 2006). All items with the exception of CA08 primarily loaded where expected. Furthermore, cross loading was minimal.

Table 1

Confirmatory Factor Analysis

To develop a CFI short form, the CFI-9, the three items with the highest loadings for CA (CA05, *I can adapt to change in the world of work*; CA02, *I can adapt to change in my career plans*; and CA06, *I will adjust easily to shifting demands at work*) and CO (CO02, *Thinking about my career inspires me*; CO1, *I get excited when I think about my career*; and CO07, *I am eager to pursue my career dreams*) were retained. All three PK items were also retained (viz., PK1, *I am good at understanding job market trends*; PK2 *I do not understand job market trends* [reversed]; PK3, *It is easy to see future employment trends*). Data from Group 2 of the sample was used to test the structural validity of the short form through confirmatory factor analysis using IMB SPSS AMOS V18 (Arbuckle, 2009). The model given as Figure 1 was tested using maximum likelihood and robust statistics. According to the recommendations by Hu and Bentler (1999), a good fitting model has a $\chi^2/(df) < 3$, Comparative Fit Index > .95, and a RMSEA , .05. The three-factor CFI short form represented a good fit for to the data $\chi^2 = 50.80(24)$ $p = .001$; Comparative Fit Index = .993; RMSEA = .038. All hypothesised paths to the latent variables were also significant (p < .01) with factor loadings ranging from .59 (CO07) to .95 (PK01).

Figure 1

Scale Properties and Relatedness to other Measures

The mean scores and correlation coefficients for the CFI-9 subscales are shown in Table 2. Compared to the original study, the mean scores and variance for CA, CO, and PK in this study were comparable to those in the study by Rottinghaus et al. The short form CA and CO subscales had adequate correlations with the original scales with correlations or $r = .88$, and $r = .73$ for CA and CO respectively. The CFI-9 subscales' correlations with other the validation measures used for this study are shown in Table 3. The low to moderate correlations with academic major satisfaction, career satisfaction, and general self-efficacy are indicative of the CFI-9's criterion validity. Overall the CFI-9 has demonstrated adequate correlations with the original scale, significant yet moderate correlation with criterion measures, and very good structural validity are suggestive of the of the CFI-9's construct validity.

Table 2

Table 3

Discussion

This study sought to examine the construct validity of the CFI-9 by assessing its factor structure in an Australian sample. Exploratory factor analysis performed in this study supported a three-factor solution for the CFI. An unexpected result was the swapping of CA and CO as the first and predominant factor. Whilst this does not detract from the three-factor solution, we suggest that this may be related to the relatively high proportion of first-year students in the sample. Confirmatory factor analysis supported the structural validity of a three-factor solution and a nine-item short form of the CFI, the CFI-9. The sub-scales of the CFI-9 correlated with one another and their coefficients of internal consistency were comparable to those of the CFI found by Rottinghaus et al. The subscales also correlated significantly with measures of engagement with studies using the AMSS, career-decidedness and satisfaction using the CCSI, general self-efficacy or confidence using the GSE scale. We therefore suggest that this study provides some evidence of the CFI's international transferability as a psychometric tool.

Rottinghaus et al. acknowledged that it was designed for college students and suggested that a version for working adults would be desirable. The age of participants in this study was not restricted to school-leavers in their first year of university: the mean age of the sample was 33.21 years, thus indicating a large proportion of undergraduate students in the current sample were mature-aged. Therefore it is reasonable to suggest that the CFI-9 is appropriate for use with mature-aged students too.

Limitations

As in the original validation study, this sample in this study was predominantly female. However, there is no reason to suspect any substantive differences across gender, as the differences in mean scores were not meaningfully appreciable, and the statistical significance of differences should be carefully considered with respect to the large sample size. This study was conducted using a sample with a relatively high proportion of students from a rural/regional and lower socio-economic backgrounds, and the majority of whom are mature-aged and do not study on campus in a full-time mode. Whilst this is concomitantly suggestive of its relevance for such a demographic sampling, there should be some caution in assuming that the CFI-9 is appropriate for all types of universities and sub-populations within the Australian higher education sector. For example, it is unknown whether the CFI-9 would produce similar results in a university that has a considerably younger population of undergraduate students who are studying full-time on campus, and who are neither from a rural/regional, nor low socio-economic background. While the current data set did not reveal a statistical relationship between the CFI-9 sub-scales and age and the number of years in the workforce, some caution is warranted nonetheless because the career status of younger regional and rural students studying on campus may vary from their metropolitan counterparts due to the latter group having greater access to graduate employment opportunities and, presumably, greater opportunity to experientially explore the world-of-work due to its proximal location. Only by comparing a sample of younger students across the demographic ranges (i.e., rural, regional, metropolitan) and institutions would there be some evidence to determine whether this is an important moderating influence to be accounted.

Research Implications

We suggest that the CFI-9 is a useful measure that partially operationalizes the model of employability by Fugate et al. (2005) who argued that career identity, personal adaptability, and social and human capital should predict employability. However, it is inappropriate to suggest that the CFI-9 be taken as the only measure of the model. For example, the CFI or CFI-9 does not directly assess personal networks that comprise the social capital variable; nor does it assess perceptions of competence with skills that comprise the human capital variable. To further explore the validity of the CFI there should be comparisons with other emerging measures of graduate employability that address these dimensions. For example, the measure of perception of graduate employability developed by Rothwell, Herbert, and Rothwell (2008) emphasises perceptions of the human/social capital dimension. Their 16-item scale, validated using data drawn from undergraduate business students in the United Kingdom, measures four inter-related components regarding employment-related perceptions of: (a) the university's brand, (b) field of study, (c) state of the external labour market, and (d) self-belief. The scale was also divided into an external-internal structure; with externally-oriented perceptions subsuming the university's reputation and the discipline's demand in the employment market; and with internally-oriented perceptions subsuming sense of confidence, engagement with studies, and aspirations. It was found to have an acceptable factor-structure and internal consistencies (Rothwell et al., 2008). Unlike the CFI, however, it was not tested against other previously published psychometric measures that tap into psychological variables to which it was hypothetically related (e.g., self-efficacy and career decidedness), and Rothwell et al. recommended further research. The results of the current study of the CFI and CFI-9 address those psychological dimensions specifically and indicate a relationship with academic satisfaction and efficacy. Other research into the CFI's validity might compare it with tools that assess graduate attributes and that have been validated within the same context and that measure the skills dimension of employability, such as the Graduate Skills Assessment (Hambur, Rowe, & Luc, 2002).

The employability model used here (Fugate, et al., 2004) includes more than graduate skills as human capital, and graduate skills alone do not equate to a conceptualisation of employability in higher education (Yorke, 2006). As the model dictates, other psychosocial and educational factors contribute to employability (e.g., labour market, skills). This study has demonstrated the conceptual and empirical potential for the CFI-9 to act as a partial measure of the perceptions of those psychosocial factors. Thus, it would be worthy to partner the CFI-9 with the aforementioned measures (Hambur, et al., 2002; Rothwell, et al., 2008) along with concurrent academic measures (e.g., grade-point average) and then proceed to advanced analytic procedures, such as structural equation modelling, that would enable testing of the employability model. In this way the model of employability could be explored through longitudinal research that tracks students' scores on measures over their years of study and then upon entry into their chosen field of employment.

Implications for Practice

The CFI or CFI-9 may be used as a formative diagnostic measure to determine whether students are engaged with their career and studies. Presumably, students who score low on career optimism and career adaptability may be at risk of feeling rather disinterested in their studies and not seeing the purpose of their being at university. This may be reason enough for the student to seek the support of a career development practitioner located at the university before the situation spirals into a state of disengagement or despair and a heightened chance of withdrawal from studies. This assertion is supported by the finding that

CA and CO have positive correlations with positive affect (i.e., morale) and negative correlations with negative affect (i.e., distress) (Rottinghaus, et al., 2005). Students who present with a low perceived career knowledge of the world-of-work may benefit from counseling or learning experiences that expose them to work-integrated learning programs that are taught in a career development learning framework (Smith et al., 2009). Yet, we urge caution: the CFI may very well serve useful in these given examples, but until there has been research into its clinical utility on a wider scale it might be prudent to embed its application with other educational assessment and intervention methods (e.g., reflective essays or journaling used in formative and summative assessment; psychometrics used for career counseling).

Conclusion

This study has provided initial evidence of the CFI-9 having psychometric properties equivalent to the original version that was validated in North America by Rottinhaus et al (2005). Pending further testing of the CFI-9 in other Australian population samples, it is suggested that this study presents evidence of the construct validity of the CFI-9 in an Australian context. This offers some evidence to reason that its properties may be similar in in other nations with similar cultural and educational systems. Furthermore, the CFI-9 subscales of career optimism, career adaptability, and knowledge of the world-of-work are presented as potential measures of students' perceptions of the graduate skills and qualities that contribute to graduate employability.

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Table 1

Three-factor solution for career adaptability, career optimism, and career knowledge

| | Component | | |
	1	2	3
CA01		-.788	
CA02		-.863	
CA03		-.674	
CA04		-.744	
CA05		-.867	
CA06		-.791	
CA07		-.767	
CA08	.355		
CA09		-.605	
CA10	.466		
CA11	.447		
CO01	.780		-.392
CO02	.818		-.355
CO03	.642		
CO04	.674		
CO05	.613		.328
CO06	.484		
CO07	.714		
CO08	.627		
CO09	.646		
CO10	.652		
CO11	.591		
PK01			.724
PK02			.715
PK03			.645

Note. *n* = 1568. CA = Career Adaptability; CO = Career Optimism; PK = Perceived Knowledge. Cut-off was set at .32 (Tabachnick & Fidell, 2006). Eigenvalues were 8.39 for CO; 2.75 for CA; and 1.89 for PK.

Table 2

Scale descriptive statistics, correlations, and alpha reliability coefficients on the diagonal for

CFI-9 subscales

Scale	*M*	*SD*	No items	α
CO	13.12	2.26	3	.84
CA	12.99	2.11	3	.82
PK	9.92	3.27	3	.86
AMSS	26.67	4.80	6	.91
CCSI	27.67	3.71	6	.84
GSE	39.23	4.83	10	.86

Note. $n = 783$. All *r* significant at p < .01. CO = Career Optimism; CA = Career Adaptability; PK = Perceived Knowledge; AMS = Academic Major Satisfaction Scale; CCSI = Career Choice Satisfaction Inventory; GSE = Generalised Self-efficacy Scale.

Table 3

Scale inter-correlations

	CFI-9 Scales		
Scale	CO	CA	PK
AMSS	.27	.21	.11
CCSI	.28	.19	.18
GSE	.17	.40	.26

Note. n = 783. All r significant at p < .01. CO = Career Optimism; CA = Career Adaptability; PK = Perceived Knowledge; AMSS = Academic Major Satisfaction Scale; CCSI = Career Choice Status Inventory; GSE = Generalised Self-Efficacy.
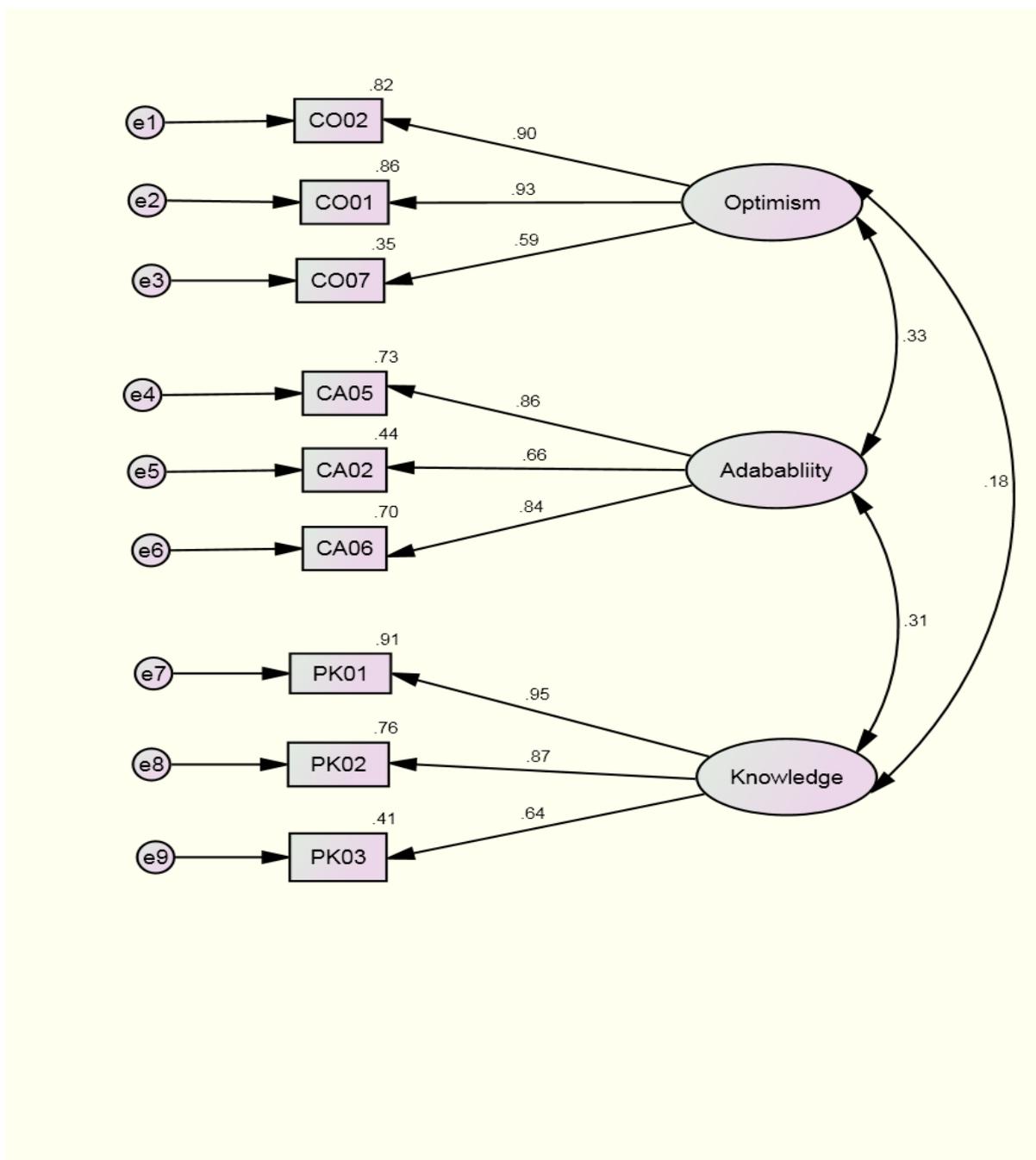
Figure 1. Structural model for the three subscales and one total scale using data from Group 2. Factor loadings of each item on the latent variables are represented with arrows. The numbers above the items indicate how much of the variance was explained.