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ABSTRACT

This paper examines the factor structure and relationships between two self-report measures of career adaptability: the revised Career Maturity Inventory "Adaptability" form (rCMI-A Savickas & Porfeli, 2011) – an attitudinal measure of career adaptability, and, the Career Adapt-Abilities Scale (CAAS; Savickas & Porfeli, 2012) which conceptualizes career adaptability as a set of psychosocial resources. Confirmatory factor analyses of data collected from 750 university students in Singapore show that the two career adaptability scales are each best modeled in terms of a second-order "general" factor and several first-order factors; and, that the second-order factors correlate .43, suggesting that they measure two different but related constructs. All three (concern, curiosity and confidence) subscales of the attitudinal rCMI-A correlate most strongly with the "concern" subscale of the CAAS rather than with the corresponding sub-scale, suggesting that career adaptability as measured in the attitudinal, rCMI-A is a narrower construct than that measured in the overall CAAS. Hierarchical multiple regression analyses also show that attitudinal career adaptability does not add the prediction of boundaryless career attitudes over career adaptability resources. We conclude that the CAAS measures a broader construct of career adaptability than the rCMI-A, and that it is more strongly related to "new economy", boundaryless career attitudes, and thus a better measure for operationalizing career construction theory.

Keywords:

Career maturity, career adaptability, career assessment, career construction theory.

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The field of career development, assessment and counseling is undergoing a paradigmic change with "career adaptability" fast replacing "career maturity" a central construct in both research and practice (Goodman, 1994, Savickas, 1997; Savickas & Porfeli, 2011, 2012). In the past century, the focus of career development was to help individuals to be more ready to decide on a job, occupation or vocation -- a question of career maturity or readiness, this focus is shifting towards assessing and strengthening the individual's abilities or "psycho-social resources" to manage occupational transitions, developmental tasks and work traumas – which are deemed vital for career adaptability in an uncertain and changing job market.

As part of this paradigm shift, Savickas and Porfeli (2011) first attempted to develop an attitudinal measure of career adaptability by examining the attitudinal items in Crites' (1978) well-established Career Maturity Inventory (CMI) Form B1 and applying Savickas' (2005) career construction theory to create four empirically-derived career adaptability attitude scales. These scales corresponded with the four dimensions of adaptability in Savickas' (2005) career construction theory as follows: a *concern* for one's future, a sense of *control* over one's careers, the *curiosity* to explore social opportunities while also experimenting with possible selves, and having the *confidence* of efficacy to design and implement one's future career.

Applying confirmatory factor analysis to data from 453 high school students in Grades 9-12, Savickas and Porfeli (2011) found that while 18 items from their concern, curiosity and confidence scales loaded well on a general factor of career readiness or adaptability, the six control items did not load as well. They attributed the latter to the fact that the control items in Crites' CMI were worded to measure lack of social independence or "consultation" rather than

intrapersonal sense of control, and thus recommended the use of the 18 concern, curiosity and confidence items as an overall measure of attitudinal career choice readiness with three subscales "measuring" or "reflecting" adaptability attitudes. They named this revised CMI "Form C" or the "Adaptability Form" (rCMI-A).

The international research team first constructed 25 "pilot"-items to measure each of the four career adaptability factors in Savickas' (2005) career construction theory, namely, concern, control, curiosity and confidence. The instructions for the scale asked respondents to rate "how strongly they have developed" each ability item on a scale of 1 (Not strong) to 5 (Strongest). In three pilot studies in the US, they reduced these to 11 items per scale using exploratory factor analysis. Finally, using data collected across 13 countries, Savickas and Porfeli (2012) reported the psychometric characteristics of a final 24-item Career Adapt-Abilities Scale (CAAS; note: 6-items per sub-scale) which fitted a hierarchical confirmatory factor model well (with one second-order general factor called "adaptability" and four first order factors labeled concern, control, curiosity and confidence). They declared the CAAS "ready for further testing and development", and which had "strong potential to be useful in the internationalization of career development research and intervention in the global economy of the 21st century" (p. 670).

The Present Study

With growing interest in the construct of career adaptability and career construction theory, it would be useful to understand how the new, psychosocial resource or competency-based measure of adaptability (i.e., the CAAS) relate to Savickas and Porfeli's (2011) earlier attitudinal measures of career adaptability in the revised CMI-Adaptability Form (or rCMI-A), in which has its roots in the measurement of career maturity or career choice readiness. The present study therefore aims to examine whether the two measures are unrelated, or is one

measure a subset of the other, such that Savickas and Porfeli's (2011) attitudinal measure of adaptability (or the rCMI-A), for example, is a narrower, construct than behavioural, competency-based career adaptability?

Creed, Macpherson, & Hood, (2011) recently argued that career adaptability should be related to "new economy career orientations" measured in terms of boundaryless career attitudes and presented empirical evidence to show that self-regulation (a proxy for adaptability in their study) is related to boundaryless career attitudes. To date, we know of no research that has examined the relationships between either or both the attitudinal rCMI-A and competency-based CAAS with boundaryless career attitudes. Therefore, in an attempt to determine the extent of conceptual overlap or uniqueness across the measures in relation to new, 21st century career paradigms such as life designing and career construction, we also examined the relative contribution of both measures of career adaptability with measures of boundaryless career attitudes (adapted by Chan et al., 2012, from Briscoe et al., 2006).

METHOD

Participants

750 undergraduate students (45% were male) from a large, comprehensive public university in Singapore participated in this study. The mean age was 23.25 years (*sd* = 1.51). 77.1% of the participants were Singaporeans; English is the primary language of education in the university. The participants came from a range of academic disciplines as follows: 37.1% engineering; 20.4% humanities, social sciences, education; 18.7% science; 23.6% business. 19.5% of the participants were in their second year of studies, 48.9% in the third year, and 31.6% were fourth year students.

Procedure

The 750 students were recruited as volunteers in a follow-up research effort that was conducted 2–3 months after a university-wide career aspiration survey that involved over 6,000 students. The volunteers were offered and paid S$20 to participate in the follow-research effort. All research procedures were approved by the Institutional Review Board, and informed consent was obtained prior to their participation. The rCMI-A was administered as part of the university-wide survey while the CAAS was administered as part of a battery of scales in the follow-up research effort. The follow-up survey questionnaire was administered via computers in a laboratory with a research assistant physically present to assist or clarify any queries from the participants. Participants completed the follow-up research questionnaire within 40–60 minutes.

Measures

Attitudinal Career Adaptability: rCMI-A. Savickas & Porfeli's (2011) rCMI-A was used in this study. Due to constraints of survey length, we included 12 (of 18) items from the sub-scales of concern, curiosity, and confidence which were selected based on a pilot study that was previously conducted with Singaporean students. As a precaution against social-desirability responding and to provide more variability in the responses, we adopted a 4-point Likert scale (1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Agree"; 4 = "Strongly agree") instead of the dichotomous (agree/disagree) scale used in the original scale. The instructions for the scale were: "This section measures the various attitudes that are important in making decisions about your career. The attitude scale, which you are about to take, asks about your attitudes and feelings about making a career choice and entering the world of work at this point in time". Table 1 shows the means, standard deviations and Cronbach alpha for the complete 12-item scale

(α = .88) including its three sub-scales concern (α = .54; note: only 3 items), curiosity (α = .78), and confidence (α = .82). Confirmatory analyses showed that a measurement model with three first order factors and one second-order, general factor could fit the rCMI-A data well (CFI = .93; SRMR = .04; RMSEA = .07; see Table 2).

Psychosocial resource or competency-based Career Adaptability: CAAS International Version 2.0. We administered the complete, 24-item CAAS which was reported by Savickas & Porfeli (2012) to have a good hierarchical factor model that could yield an overall "Adaptability" score (general factor) and four sub-scores for concern, curiosity, control and confidence. Participants were instructed: "Different people use different strength to build their careers. No one is good at everything; each of us emphasizes some strengths more than others. Please rate how strongly you have developed each of the following abilities using the scale below". A five-point response scale was provided as follows: 1 = "Not strong", 2 = "Somewhat strong", 3 = "Strong", 4 = "Very Strong", 5 = "Strongest". Sample items were as follows: "Thinking about what my future will be like" (*Concern*), "Probing deeply into questions I have" (*Curiosity*), "Making decisions by myself" (*Control*), "Overcoming obstacles" (*Confidence*). The scale Cronbach alpha statistics for the 24-item scale (α = .95) and four sub-scales for concern (α = .87), curiosity (α = .86), control (α = .87) and confidence (α = .91) were good; see Table 1. Confirmatory analyses showed that a measurement model with four first order factors and one second-order, general factor provided very good fit to the CAAS data (CFI = .94; SRMR = .04; RMSEA = .06; see Table 2).

Boundaryless Career Attitudes: Protean and Boundaryless Career Attitude Scale (PBCA). Boundaryless career attitudes were measured using Chan et al.'s (2012) adaptation of Briscoe, Hall and Demuth's (2006) PBCA for use among university students. Respondents

indicated on a 5-point scale, the extent to which they felt the statements were true about them (1 = *little or no extent*, 5 = *to a great extent*). A higher score on each of the subscales indicated a greater degree of boundaryless career attitude. Exploratory factor analyses revealed three interpretable factors corresponding to the boundaryless mindset (7-items, α = .91), self-directed career attitude (7-items, α = .78), and organizational mobility preference (5-items, α = .71) constructs. The values-based career attitude factor did not emerge clearly.[1] Means, standard deviations and Cronbach alpha statistics for the overall PBCA (19-item) and three sub-scales are presented in Table 1. Confirmatory analyses showed that a measurement model with three first-order factors and one second-order, general factor provided good fit to the data (CFI = .93; SRMR = .05; RMSEA = .06; see Table 2).

FINDINGS

Preliminary Checks against threat of Common-method bias

Because the data were based on cross-sectional, self-report surveys, the findings may be subjected to common method bias. We therefore checked the correlation matrices (see Table 1) and noted a mix of positive, negative, and non-significant, near-zero coefficients, which suggested that common method bias was not a significant concern (Spector, 2006). Next, we used MPlus 7.1 (Muthén & Muthén, 1998-2012) to conduct Harman's single-factor test to examine whether the majority of the variance could be accounted for by one general factor (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Results showed that the variance explained by the general factor (3.5%) was below the 25% average in published studies (Williams, Cote, & Buckley, 1989), which also indicated that common method bias was not a significant threat to the findings.

[1] The lead author of the measure advised us that this factor was problematic in non-US samples.

Confirmatory Factor Analyses of rCMI-A and CAAS relationships

Confirmatory factor analyses were conducted to examine the relationships between the measures and scales. First, we found that fitting a single common-factor to the 36 items of both career adaptability scales generated poor model fit (CFI = .64; SRMR = .11; RMSEA = .11; see Table 2), which indicated that there were different latent factors underlying the variance in the two measures. Next, we compared the fit of a model with two first-order factors versus a model with seven first-order factors with two second-order factors for 36-items for both scales. From Table 2, we can see that the model with two second-order factors and seven first-order with fitted the data much better (CFI = .90; SRMR = .06; RMSEA = .06) than the model with only two first order factors (CFI = .80; SRMR = .07; RMSEA = .08; see Table 2).

Figure 1 shows the factor loadings of the first-order factors on the two second-order factors; the second-order factors were correlated at r = .43, suggesting that the attitudinal rCMI-A form and the CAAS measured two different but related constructs. Examination of the inter-scale correlations in Table 1 showed that all three subscales of the attitudinal adaptability: concern, curiosity, and confidence correlated most strongly with the "concern" subscale of the competency-based CAAS measure of adaptability (r = .40, .37, and .30 respectively) rather than with the corresponding sub-scale. This suggested that attitudinal career adaptability as measured in the rCMI-A form is a narrower construct related more to "concern" as measured in the psychosocial, competency-based CAAS measure of adaptability.

Relationships with the 21st Century Boundaryless Career Attitudes

The inter-scale correlations in Table 1 indicate that the 21st century career attitudes are more strongly related to the competency-based CAAS measure of adapt-ability (r = .55) than with the attitudinal rCMI-A measure of career adaptability (r = .24).

We conducted hierarchical multiple regression analyses where attitudinal and competency-based career adaptabilities were added in different sequences to predict boundaryless career attitudes. The results in Table 3 show that competency-based career adaptabilities measured via the CAAS, especially CAAS-control and CAAS-curiosity factors — accounted for most of the variance (R^2 = .32) in the overall measure boundaryless career attitudes with the boundnaryless mindset (R^2 = .30) and self-directed, protean attitude sub-scales (R^2 = .33). In contrast, attitudinal career adaptability measured via the rCMI-A explained limited variance in boundaryless career attitudes (R^2 = .07). The results also indicate that both attitudinal and competency-based adaptabilities explain little variance in organizational mobility preference.

CONCLUSION & DISCUSSION

In view of the growing interest in career adaptability, this paper has examined the validity of two recently developed measures of career adaptability – one of which attempting to measure attitudinal career adaptability by revising the well-established Career Maturity Inventory (i.e., rCMI-Adaptability form; Savickas & Porfeli 2011), and the other which operationalized adaptability in terms of psychosocial resources or competencies (i.e., CAAS; Savickas & Porfeli, 2012). Our data from 750 undergraduate students shows that the two career adaptability scales are each best modeled in terms of a second-order "general" factor and several first-order factors; and, that the second-order factors correlate .43. This indicates that the scales measure two different but related constructs.

To the extent that both measures were designed to measure the key dimensions of career adaptability as captured in Savickas' (2005) career construction theory, namely, concern for one's future, a sense of control over one's careers, the curiosity to explore social opportunities while also experimenting with possible selves, and having the confidence of efficacy to design

and implement one's future career. We expected that each subscale would correlate most with the corresponding subscale in the other measure. However, the data showed that all three (concern, curiosity and confidence) subscales of the attitudinal rCMI-A correlated most strongly with the "concern" subscale of the CAAS rather than with the corresponding sub-scale. We can therefore conclude that career adaptability as measured in the attitudinal, rCMI-A is a narrower construct than that measured in the overall CAAS.

Finally, in view of the centrality of the career adaptability to "new economy", boundaryless context of careers in the 21st century, we conducted hierarchical multiple regression analyses to examine the extent to which the different (attitudinal versus psychosocial competency) conceptualisations of career adaptability related to boundaryless career attitudes. The analyses showed that attitudinal career adaptability did not add the prediction of boundaryless career attitudes over career adaptability resources, suggesting that the CAAS is more strongly related to "new economy", boundaryless career attitudes, especially boundaryless mindset and protean attitudes but not organizational mobility preference.

Overall, we can conclude that Savickas and Porfeli's (2012) CAAS is a better measure for operationalizing career construction theory than the rCMI-A; that attitudinal adaptability measured by the rCMI-A is a narrower construct that seems to overlap with concern in the overall CAAS. We therefore call for more research to employ the CAAS as a measure of career adaptability for the 21st century context of careers.

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Table 1

Descriptive Statistics, Correlations, and Reliabilities of Measures

Scale (no. items)		M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. **Attitudinal adaptability (rCMI-A)**	12	2.78	.51	**(.88)**												
2. rCMI-A: Concern	3	3.02	.54	.74**	**(.54)**											
3. rCMI-A: Curiosity	4	2.76	.59	.88**	.53**	**(.78)**										
4. rCMI-A: Confidence	5	2.66	.61	.92**	.53**	.70**	**(.82)**									
5. **Competency-based adaptability (CAAS)**	24	3.47	.64	.37**	.33**	.37**	.27**	**(.95)**								
6. CAAS: Concern	6	3.34	.76	.40**	.40**	.37**	.30**	.84**	**(.87)**							
7. CAAS: Control	6	3.58	.70	.33**	.26**	.34**	.25**	.87**	.66**	**(.86)**						
8. CAAS: Curiosity	6	3.45	.75	.22**	.20**	.22**	.16**	.87**	.61**	.68**	**(.87)**					
9. CAAS: Confidence	6	3.52	.73	.33**	.28**	.34**	.24**	.88**	.65**	.71**	.71**	**(.91)**				
10. **Boundaryless career attitudes (PBCA)**	19	3.57	.50	.24**	.22**	.22**	.20**	.55**	.42**	.50**	.53**	.44**	**(.79)**			
11. PBCA: Boundaryless mindset	7	3.71	.71	.16**	.19**	.14**	.11**	.53**	.42**	.46**	.53**	.43**	.86**	**(.91)**		
12. PBCA: Self-directed attitude	7	3.71	.57	.24**	.22**	.22**	.19**	.56**	.46**	.54**	.50**	.46**	.79**	.57**	**(.78)**	
13. PBCA: Organisational mobility preference	5	3.19	.70	.15**	.08*	.15**	.15**	.08*	.01	.08*	.12**	.07	.57**	.24**	.17**	**(.71)**

Note. Numbers on the diagonal represent alpha coefficients. ** $p < .01$. * $p < .05$.

Table 2

Fit Statistics for Measurement Models Tested

Model tested	$\chi 2$	*df*	$\chi 2/df$	CFI	SRMR	RMSEA	AIC	BIC
Confirmatory factor analyses of measures								
i. rCMI-A three 1st order & one 2nd order factor model	262.83	51	5.15	.93	.04	.07	17901.96	18082.14
ii. CAAS four 1st order & one 2nd order factor model	1160.44	248	4.68	.91	.04	.07	39018.61	39369.74
iii. PBCA three 1st order & one 2nd order factor model	566.90	149	3.80	.93	.05	.06	32713.52	32990.72
Measurement models of rCMI-A and CAAS								
iv. One common factor model	5717.32	594	9.63	.64	.11	.11	60454.54	60953.51
v. Two general 1st order factor model	3439.68	593	5.80	.80	.07	.08	58178.90	58682.49
vi. rCMI-A three 1st order & one 2nd order, and CAAS four 1st order & one 2nd order factor model	2059.62	586	3.51	.90	.06	.06	56812.85	57348.77

Table 3

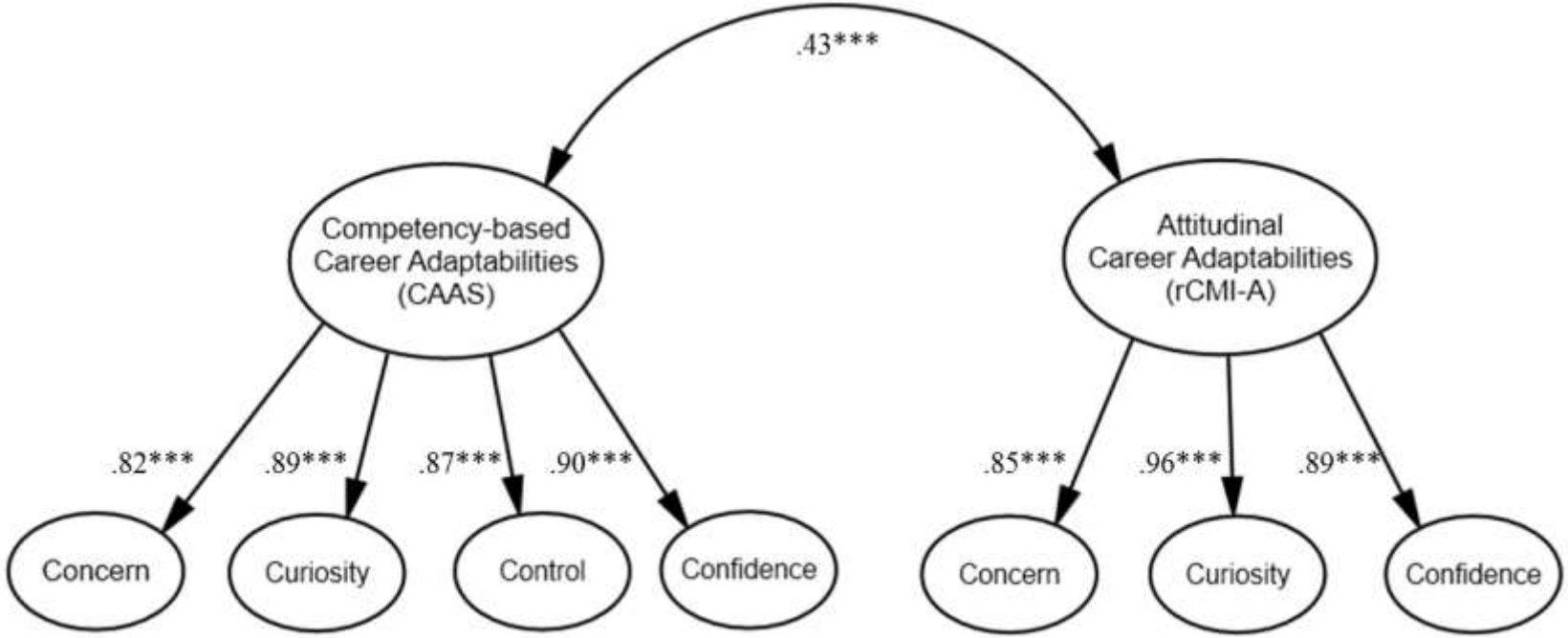
Hierarchical regression of the Boundaryless Career Attitudes on attitudinal and competency-based adaptabilities

	Boundaryless career attitudes				Boundaryless mindset				Self-directed attitude				Organisational mobility preference			
	β_{model1}	β_{model2}	β_{model3}	β_{model4}	β_{model1}	β_{model2}	β_{model3}	β_{model4}	β_{model1}	β_{model2}	β_{model3}	β_{model4}	β_{model1}	β_{model2}	β_{model3}	β_{model4}
rCMI-A																
Concern	.14***	.06	–	.06	.16***	.08*	–	.08*	.14***	.05	–	.05	-0.02	.01	–	.01
Curiosity	.13*	-.01	–	-.01	.07	-.07	–	-.07	.13*	-.03	–	-.03	0.1	.11*	–	.11*
Confidence	.04	.05	–	.05	-.02	.00	–	.00	.03	.04	–	.04	0.09	.09	–	.09
CAAS																
Concern	–	.02	.06	.02	–	.08	.10*	.08	–	.09*	.12**	.09*	–	-.17**	-.12*	-.17**
Control	–	.23***	.23***	.23***	–	.15**	.14**	.15**	–	.32***	.32***	.32***	–	.03	.06	.03
Curiosity	–	.36***	.34***	.36***	–	.37***	.37***	.37***	–	.20***	.20***	.20***	–	.20***	.17**	.20***
Confidence	–	-.01	.00	-.01	–	.01	.00	.01	–	.01	.01	.01	–	-.05	-.02	-.05
R^2	.07	.33	.32	.33	.04	.31	.30	.31	.07	.34	.33	.34	0.03	0.05	.02	.05
ΔR^2		.27***		.01*		.27***		.01		.27***		.01		.02***		.03***

Note. ***$p \leq .001$; **$p \leq .01$; *$p \leq .05$.

Figure 1

Measurement Model of Attitudinal (CMI) and Competency-based (CAAS) Career Adaptabilities



Note. Standardized factor loadings are reported. ***$p \leq .001$.