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The Career Adapt-Abilities Scale

Human survival and success require adapting to ever-changing circumstances. Career adaptability denotes the capacity to use psychosocial resources to adapt to changing contexts for career satisfaction and success. A meta-competency for effective career construction and life design, career adaptability offers a cross-nationally valid construct for understanding vocational behavior and assisting individuals to manage their careers within a changing world, local economies, and job markets. The advancement of career adaptability as a construct and focus of career intervention owes in large part to a wealth of literature that has accumulated to map the conceptual network and measurement of the construct. This literature has grown, especially within the past decade, accelerated by the work of concerted international collaborations. The Career Adapt-Abilities Scale (CAAS) represents the standard measure of career adaptability. A team of researchers from 13 countries initially constructed and validated the CAAS to measure career adaptability as a higher-order construct that subsumes four psychosocial resources for managing developmental tasks, occupational transitions, and work troubles. Thereby, the 24-item CAAS comprises 4 subscales with 6 items each to measure the career adapt-abilities of Concern (planfulness), Control (deliberateness), Curiosity (inquisitiveness), and Confidence (assuredness). This chapter reports on the development of the CAAS and validity evidence for its use from studies spanning 24 countries. Alternate forms of the CAAS include a 12-item short form, a behavioral measure, and a Francophone version that adds 7 additional items to the measure. The chapter also discusses a measure for Cooperation as a fifth interpersonal resource to support adapting behaviors.

Introduction

In the twenty-first century, the global economy of post-industrial society begets employment instability. For most people, the new economy has replaced life-time employment in a 30-year career with a series of contingent positions that consist of projects and assignments. Job changes and transitions have become increasingly common among adults because of the reorganization of work-life and employment into careers characterized as boundaryless (Arthur, 1994) and protean (Hall, 2004). The move from *institutionalized* life-course patterns to *individualized* biographies has made workers responsible for managing their own de-standardized careers. In the context of greater complexity and diversity of career paths, it has become important for individuals to manage their own careers, make multiple transitions, and keep up with new demands on the job. Today, continuous adaptation to the work environment is crucial to achieve job success and maintain career satisfaction.

This individualization of work-life as a biography of choice required innovation in career theory and interventions. The mid-twentieth-century constructs of career development and maturity do not comprehend the individualized, de-institutionalized, and de-standardized career trajectories of post-modern societies that are rife with uncertainty and risk. Thus, Super and Knasel (1981) argued

for a more forward-looking and proactive construct to replace "maturity," one that "allows greater emphasis to be given to the novel, non-maturational problems which presently confront many people" (p. 199). They proposed the construct of "career adaptability" and defined it as "readiness to cope with changing work and working conditions" (Super & Knasel, 1981, p. 195). Today, adaptability is key to managing the complexity of one's career in the midst of transformations wrought by a fourth industrial revolution that has reshaped social institutions and patterns of employment. To manage a twenty-first-century work life, individuals must develop the adaptability required to deal with the challenges and changes presented by the new employment patterns.

An excellent description and analysis of the early development of the *adaptability* construct appeared in an article by Goodman (1994). Goodman explained how Hall (1986) promoted the construct of adaptation in organizational psychology, arguing that career adaptability is central to achieving career effectiveness in a changing environment and important in enabling individuals to manage shifting social demands. Subsequently, Hall and Mirvis (1995) asserted that the ability to adapt to changing tasks, engage in life-long learning, and regulate one's career direction were critical for both (a) managing one's career rather than developing it and (b) meeting employers' demand for an increasingly adaptable workforce. Hall and Mirvis (1995) emphasized the need for contemporary workers to develop the "meta-skills" of career identity and personal adaptability. These two higher-order qualities or meta-competencies engender the capacity to master specific skills. In this sense, adaptability and identity are each a meta-skill, that is, a skill required for learning how to learn. Mastering a meta-competency enables one to learn many specific skills.

Career Construction Theory (CCT; Savickas, <u>2020</u>) characterizes career adaptability as a psychosocial strength or capacity for solving unfamiliar, complex, and ill-defined problems presented by developmental vocational tasks, occupational transitions, and work troubles. building on Morrison and Hall's (<u>2002</u>) description of adaptability as the capacity to change in responding to a new situation, CCT conceptualizes adaptability as *self-regulation resources* that individuals activate to manage career changes or challenges. Self-regulation denotes attitudes, beliefs, and competencies that enable people to override impulses and select their own responses in enacting behaviors that move them toward a goal (Karoly, <u>1993</u>). Activation of self-regulation resources in the career domain occurs in response to organizational, social, or task changes such as the school-to-work transition or job loss. In CCT, the self-regulation resources that constitute career adaptability are a component in a more extensive model of career adaptation.

The CCT model of career adaptation distinguishes among the constructs of adaptivity, adaptability, adapting, and adaptation. The personality trait of *adaptivity* is defined as a disposition of personal readiness and motivational willingness to make changes in response to vocational development tasks, occupational transitions, and work troubles. As a dispositional trait, career adaptivity acts as a filter through which individuals interpret the environment and, when needed, activate self-regulation processes to better adjust to imminent and intermediate transitions. As a motivational orientation, adaptivity guides and maintains movement across transitions. During transitions, highly adaptive individuals activate their adaptability resources and engage adapting responses to bridge the transition (Savickas, 2020).

Adaptability refers to the capacity to change behavior to meet different circumstances. In general, adaptability as a self-regulation "capacity" or "ability" increases the degree to which human behavior is flexible and able to adapt (Baumeister & Vohs, 2007). Career adaptability denotes self-regulation resources for coping with unfamiliar, complex, and ill-defined problems presented by current and anticipated vocational development tasks, occupational transitions, and work troubles that, to some degree large or small, alter an individual's social integration (Savickas, 1997). These self-regulation strengths reside at the intersection of person-in-environment. Thus, adaptability refers to psychosocial competencies that develop through interactions between the inner and outer worlds of a person. General career adaptability comprises four particular adapt-ability dimensions: (a) Concern, denoting a future orientation and inclination to anticipate and prepare for career moves; (b) Control, involving taking responsibility for building a career and becoming deliberate and conscientious in shaping the work environment and work future; (c) Curiosity, denoting inquisitiveness about possible selves in various educational and vocational roles; and (d) Confidence, involving assuredness to make realistic career decisions and move toward educational and vocational goals.

Adapting refers to actual responses – both conative beliefs and strategic behaviors – intended to bring about change to better meet personal aspirations and environmental demands. Thus, adapting responses include both beliefs about and the performance of behaviors that address novel situations and changing conditions. The CCT model of adaptation distinguishes variables that belong to the process of adapting from those that result from the process.

Career **adaptation** results denote the outcomes of adapting responses to vocational development tasks, occupation transitions, and work troubles. The outcomes may involve a task accomplished, change achieved, or problem solved. Table <u>1</u> presents definitions of and descriptive qualities for the four career adapt-abilities.

Table 1 Adapt-Ability Resources Defined and Described

From: Career Adapt-Abilities Scale (CAAS)

Adapt-Ability Resources	Descriptive Qualities
Concern – Oriented toward the future and inclined to anticipate and prepare for career moves	Aware, oriented, anticipating, involved, planful
Control – Disposed toward deliberateness and conscientious in building a career	Conscientious, responsible, assertive, reliable, disciplined
<i>Curiosity</i> – Given to inquisitiveness about possible selves, opportunities, and information	Open, inquisitive, exploratory, imaginative, innovative
Confidence – Assuredness to make realistic career decisions and solve problems in moving toward occupational goals	Resilient, assured, flexible, efficient, persistent, steadfast

Development of the Career Adapt-Abilities Scale

The CAAS, the standard measure of career adaptability, measures career adaptability as a higher-order construct that subsumes four psychosocial resources for managing developmental tasks, occupational transitions, and work troubles. Researchers from 13 countries collaborated in constructing the CAAS (Savickas & Porfeli, 2012). The team worked together, communicating in the English language, to linguistically explicate and operationally define career adaptability as a meaningful construct in each of their own countries. The first step in inventory construction was

to discuss cross-cultural similarities and differences as well as examine indigenous theoretical models. The International Team used the N-way approach (Brett et al., 1997) to highlight culture-specific and culture-general conceptions and aspects of adaptability. Based on 4 pilot studies, each was field tested in each of the 13 countries, a Career Adapt-Abilities-Research Form (CAAS-RF) consisting of 55 items was developed. The CAAS-RF contained 11 items for 5 possible scales named Concern, Control, Curiosity, Confidence, and Cooperation. Extensive psychometric analyses reduced the number of items from 11 to 6 for the Concern, Control, Curiosity, and Confidence subscales (Savickas & Porfeli, 2012). The resulting CAAS consists of four subscales with six items each to measure the adapt-abilities of Concern, Control, Curiosity, and Confidence (Savickas & Porfeli, 2012; see Appendix for the scale items). Items representing the proposed Cooperation subscale (11 items shown in Table 3) were not used in the CAAS because they measured interpersonal rather than intrapersonal resources.

The age of participants varied across countries. In Belgium, Dries et al. (2012) sampled 700 high school, college, and university students with a mean age of 17 for the high school sample, 20 years for the college and university samples. In Brazil, Teixeira et al. (2012) sampled 908 adults with a mean age of 29 years. In China, Hou et al. (2012) sampled 296 university students with a mean age of 20 years. In France, Pouyaud et al. (2012) sampled 609 11th grade students with a mean age of 16.6 years. In Iceland, Vilhjálmsdóttir et al. (2012) sampled 1566 students with a mean age of 28 years (70% of whom were between ages 14 and 30). In Italy, Soresi et al. (2012) sampled 762 adolescents with a mean age of 17 years. In Korea, Tak (2012) sampled 278 college students with a mean age of 22 years from an introductory psychology class. In The Netherlands, van Vianen et al. (2012) sampled 465 college students with a mean age of 21 years. In Portugal, Duarte et al. (2012) sampled 916 participants (255 high school students with a mean age of 15 years; 395 employed adults with a mean age of 47 years; and 266 unemployed adults with a mean age of 22 years enrolled in training activities). In South Africa, Maree (2012) sampled 435 high school students with a mean age of 15.5 years enrolled in grades 9 and 11. In Switzerland, Rossier et al. (2012) sampled 391 adults with a mean age of 40 years. In Taiwan, Tien et al. (2012) sampled 493 adults with a mean age of 37 years. In the USA, Savickas and Porfeli (2012) sampled 460 10th and 11th grade students with a mean age of 16.5 years.

Participants indicated how strongly they had developed 24 abilities on a response scale that ranged across not strong (1), somewhat strong (2), strong (3), very strong (4), and strongest (5).

Mean scores were high with Adaptability = 3.81; Concern = 3.82; Control = 3.92; Curiosity = 3.73; and Confidence = 3.87. Taiwan, China, and Iceland had the highest mean scores for all scales, while France, Korea, and Italy had the lowest mean scores. The differences in mean scores, or in other words, the lack of scalar invariance, were expected because the subscales measure context-sensitive, psychosocial capital. The meaningfulness of the differences in scores could not be interpreted because some unknown part reflected a measurement artifact rather than a true difference. The team recommended further study to identify theoretical predictors of the mean differences between economies, cultures, and countries to determine the extent to which they explain observed differences (Savickas & Porfeli, 2012).

The reliabilities of the CAAS total score and subscale scores ranged from acceptable (0.65) to excellent (0.96) when computed with the combined data. As expected, the reliability estimates varied across countries. Nevertheless, the internal consistency estimates for the four subscales of

Concern, Control, Curiosity, and Confidence were generally acceptable to excellent across all the countries (Savickas & Porfeli, <u>2012</u>).

Confirmatory Factor Analyses of International Study Data

Savickas and Porfeli (2012) assembled the data from the partner countries into one large data set in order to conduct a confirmatory factor analysis (CFA). This analysis assessed the fit between the observed data and the a priori theoretical model that specified hypothesized hierarchical relations among the items, first-order factors (i.e., Concern, Control, Curiosity, and Confidence), and second-order factors (i.e., career adaptability). As reported by Savickas and Porfeli (2012), the standardized factor loading for items to first-order factors ranged from 0.56 to 0.75, with the exception of 0.48 for item 7 ("Keeping upbeat"). This item was shown to be a little problematic in later studies in Portugal and Iceland. Loadings for the first-order factors (i.e., career-adapt-ability dimensions) to a second-order factor (i.e., career adaptability construct) ranged from 0.78 to 0.90.

The next step involved conducting separate CFAs for each country to assess the fit between the observed data and the a priori theoretical model. Results for each country indicated that the data adequately fit the theoretically derived measurement model based on the established criteria of RMSEA and SRMR fit indices for the unconstrained model with unequal N. The results support structural equivalence of the model across the countries because the same factor model fits the data in each country. While the fit indices were acceptable for each country, they varied across countries. The three countries with the best fit for the model were the USA, South Africa, and Italy. Thus, the theoretically derived measurement model of the CAAS worked best in these countries. The three countries with the poorest fit to the model were the Netherlands, Iceland, and Korea. Despite having the poorest indices, the fit of data to the model for those countries was adequate and acceptable. Separate articles in a special issue of the *Journal of Vocational Behavior* (Leong & Walsh, 2012) reported the psychometric characteristics of the *CAAS*, including initial validity evidence, for each of the 13 countries represented in constructing the scale.

The goodness of fit indices for 11 of the 13 countries appear in Table 2. Indices for Brazil and Portugal do not appear because they used only four items for the Control and for the Confidence subscales because of a miscommunication from the study coordinator (Savickas & Porfeli, 2012). A model is considered to have an acceptable fit if the χ^2 /df is equal to or below 3, the CFI value is about 0.90 or above. Good fit is indicated by RMSEA values below 0.08 and by SRMR values less than 0.05 with values less than 0.08 considered acceptable (Cheung & Rensvold, 2002).

Table 2 Structural Model Fit Indices for the CAAS in 11 Countries

From: Career Adapt-Abilities Scale (CAAS)

Country	χ^2/df	CFI	RMSEA	SRMR
Belgium	2.02	0.90	0.053	0.057
China	2.14	0.86	0.64	0.057
France	2.98	0.86	0.056	0.054
Iceland	9.57	0.87	0.073	0.062
Italy	3.62	0.89	0.058	0.049
Korea	2.33	0.89	0.067	0.060
Netherlands	3.00	0.85	0.068	0.070
South Africa	1.77	0.92	0.046	0.048
Switzerland	2.79	0.88	0.071	0.056
Taiwan	3.67	0.92	0.078	0.049
USA	2.24	0.94	0.052	0.040

Notes: χ^2/df , Chi-Square divided by the Degrees of Freedom

CFI, Comparative Fit Index; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Squared Residual

Subsequent Evidence of Psychometric Properties

The hierarchical structure of the CAAS has been supported in numerous countries including Australia (Tolentino et al., 2013; McIlveen et al. 2018), Brazil (Audibert & Teixeira, 2015; Ambiel et al., 2016; Cammarosano et al. 2019), Croatia (Šverko et al., 2015), the Czech Republic (Hlad'o et al., 2020), Iran (McKenna, et al., 2016; Nilforooshan & Salimi, 2016), Germany (Johnston et al., 2013b), Hong Kong (Yuen & Yau, 2015; Hui et al., 2018), Lithuania (Urbanaviciute et al., 2014), Macau (Tien, et al., 2014), Papua New Guinea (de Guzman & Choi, 2013), Nigeria (Olugbade, 2016), the Philippines (Tolentino et al., 2013), Portugal (Monteiro & Almeida, 2015), Romania (Negru-Subtirica & Pop, 2016), Serbia (Tolentino et al., 2013; Mirkovic et al., 2020), Spain (Merino-Tejedor et al., 2016), Singapore (Chan et al. 2015), Thailand (Sibunruang et al., 2016), and Turkey (Kanten, 2012; Öncel, 2014). In each country, the results resembled those reported by research teams in the original set of 13 countries (Savickas & Porfeli, 2012).

Multiple studies support the convergent validity (e.g., Öncel, 2014) and discriminant validity (Duarte et al., 2012; Fasbender et al., 2019) of the CAAS. Evidence for test-retest reliability of the CAAS has been reported in five studies. For example, Di Maggio et al. (2015) examined test-retest reliability with 239 male and 209 female middle-school students in Italy. The CAAS total score had a temporal stability coefficient of 0.93 over a 3-month period. The correlation coefficients over this interval were 0.79 for Concern, 0.69 for Control, 0.81 for Curiosity, and 0.86 for Confidence. The researchers also used multiple-group second-order CFA to test the measurement invariance of the CAAS across gender. The results supported measurement invariance for gender, with boys and girls perceiving the adaptability resources similarly (Di Maggio et al., 2015).

Hirschi and Valero (2015) provided strong support for the hierarchical-factor model and the

variable-based approach to studying career adaptability. At the population level, different groups cluster in terms of their overall level of adaptability. These latent profile analyses results may be attributed to the inter-correlations among the four adapt-abilities. The correlations suggest rank-order stability across the four subscales. In other words, if a person scores high on one adapt-ability, then chances are that she or he will score high on the other three adapt-abilities. However, the inter-correlations are not exceptionally high, so there remains the possibility for a variety of different profile shapes for people who exhibit the same level of adaptability yet achieve this level with various amounts of the four adapt-abilities.

A brief version of the CAAS was produced by Maggiori et al. (2017) for possible use in lengthy surveys that include a battery of tests. The authors sought to reduce the number of items to three per subscale yet preserve the excellent psychometric properties of the CAAS. The study participants lived in Switzerland and consisted of 2800 French- and German-speaking adults aged between 20 and 65 years ($M_{\rm age} = 41.2$; SD = 9.4). Women represented 51.0% of the sample, and German-speakers represented 52.8%. Using a principal-component analysis with promax rotation, they reduced the total number of items to 12. They then tested the items for four first-order factors (Concern, Control, Curiosity, and Confidence) and a second-order factor (career adaptability). Overall, the model showed a satisfactory fit with a χ^2 /df of 4.18, a RMSEA lower than 0.04, and NFI, CFI, and TLI values all above 0.95. The loadings from the items to the corresponding factor varied between 0.63 and 0.94, and from the factors to the career adaptability factor, the coefficients ranged between 0.73 and 0.88. Furthermore, the 12-item and 24-item versions correlated strongly. Moreover, the 12-item Career Adapt-Abilities—Short Form (CAAS-SF) showed psychometric and structural properties close to those of the 24-item CAAS (Maggiori et al., 2017) (see Appendix for the CAAS-SF) items).

An attempt to include a "Cooperation subscale" as an intrapersonal dimension of the CAAS failed in the initial attempt by the International Research Team (Savickas & Porfeli, <u>2012</u>). The Cooperation subscale itself showed excellent psychometric properties, yet it did not cohere with the other four adapt-ability subscales in the CAAS (i.e., Concern, Control, Curiosity, and Confidence). The International Team concluded that Cooperation is an interpersonal resource that supports adaptability, but is not an intrapersonal resource. Nevertheless, several team members – including Vilhjálmsdóttir, Einarsdóttir, McMahon, Watson, and Bimrose – astutely noted that the Cooperation subscale may be more relevant in cultures where relational support for career adaptation is an important factor. They suggested that the CAAS measures internal resources activated within the self, whereas the Cooperation subscale may measure external resources activated within the community. The 11-item Cooperation subscale used as part of the CAAS-RF by the International Research Team appears in Table <u>3</u>.

Table 3 Cooperation Subscale Items

From: Career Adapt-Abilities Scale (CAAS)

	item
1.	Becoming less self-centered
2.	Acting friendly
3.	Getting along with all kinds of people
4.	Cooperating with others on group projects
5.	Playing my part on a team
6.	Compromising with other people
7.	Learning to be a good listener
8.	Contributing to my community
9.	Going along with the group
10.	Sharing with others
11.	Hiding my true feelings for the good of the group

Translation of the Career Adapt-Abilities Scale

An expanded French-Language Form of the CAAS was produced by Johnston et al. (2013a), who re-analyzed the CAAS-Research Form. The Research Form contained 11 items per subscale; however, the results of the International Study identified 7 items per scale that worked well. In the end, the CAAS (i.e., the standard 24-item form) uses only the best 6 items for each subscale because no psychometric advantage came from using the seventh item on each subscale (Savickas & Porfeli, 2012). In their study, Johnston et al. (2013a) administered the CAAS-Research Form in France and the French-speaking regions of Switzerland, Belgium, and Luxembourg. They used the 11-item subscales for Concern, Control, Curiosity, and Confidence. The combined sample of 1707 participants (57% females, 40% males) ranged in age from 13 to 79 years ($M_{age} = 24.22$; SD = 12.33). The Swiss sample (n = 468) consisted of 54% females and 46% males, with an age range of 14 to 79 years ($M_{age} = 35.92$; SD = 13.37). Participants in the Belgian sample (n = 395) consisted of 54% females and 35% males, with ages ranging from 16 to 21 years ($M_{\rm age} = 17.49$; SD = 0.87). The Luxembourg sample had 181 participants ranging in age from 16 to 75 years $(M_{\rm age} = 33.61; \, {\rm SD} = 12.90)$, with 68% female and 32% male participants. Finally, the French sample (n = 663) consisted of 42% males and 58% females, with ages ranging from 13 to 21 years $(M_{\rm age} = 16.59; SD = 0.88)$. The study confirmed that the seven items per subscale functioned well in the Francophone regions, possibly because the item content reflected cultural differences. They added the 7 items to the 24 items in the CAAS to construct the CAAS Francophone Form. Consult Johnston et al. (2013a) for a listing of these additional items.

Cultural Considerations

Some cultural or sample characteristics may influence CAAS scores. Savickas and Porfeli (2012) noted that "culture and context may place boundary conditions around adaptability" (p. 3). Given that the CAAS was developed in 13 countries, it was important to determine the measurement equivalence of the CAAS, that is, whether respondents from different countries and cultures interpreted the items in a conceptually similar manner. Savickas and Porfeli (2012) assessed the

CAAS hierarchical factor model and its invariance across countries using mean and covariance structure (MACS) analysis. This approach extends the traditional covariance structure analysis within a CFA framework to include an analysis of the latent mean structure of the CFA model. First, they examined configural invariance to explore the basic structure of the construct "adaptabilities" cross-nationally and determine if the same items load on the same factors across the different countries. These results largely confirm the configural invariance of the measurement model across all countries.

Second, Savickas and Porfeli (2012) examined the structural relationships among the constructs. This more stringent form of measurement equivalence is called metric invariance, and means that the factor loadings associated with items are equivalent across countries. The results showed that the CAAS demonstrated metric invariance in that the scale items showed similar relations among the latent constructs across countries. Thus, the results suggest that the CAAS measures the same constructs in the same way across countries. It also had acceptable but varied reliability across all the countries.

Third, Savickas and Porfeli (2012) examined scalar invariance, that is, the equivalence of mean scores across countries. They had not expected the CAAS to show scalar invariance because adaptabilities are psychosocial variables, not purely psychological traits independent from context. The CAAS did not exhibit scalar invariance in that the subscale means, as expected, were not equal across countries. Fourth, they examined measurement precision in terms of residual invariance to determine whether the unexplained variance was equivalent across countries. It shows whether the random error variances of the observed items are equal across groups. The CAAS did not exhibit strict residual invariance, which requires an equality of the residuals of the indicators across countries. This test of measurement precision is not required to conclude that the constructs are measured equivalently across groups. Finally, they conducted a rigorous, multi-step examination that ruled out potential threats to the accuracy of the results concerning measurement equivalence on the basis of disproportion representation of certain countries with more participants (Savickas & Porfeli, 2012).

Five additional studies of measurement invariance tested groups within one country to examine possible differential item functioning in the relations between item responses and the construct to be quantified. To examine more closely the differences in scores obtained by adolescent students and adult workers, Ambiel et al. (2016) analyzed whether any of the 24 items in the CAAS had an increasing probability of endorsement by one group than another. Twelve items displayed differential functioning, five favoring adolescents and seven favoring adults. The content of the two sets of items that favored each group showed coherence. The five items that favored adolescents were on the Concern and Control subscales. Three of the items involved Concern about and preparing for the future, as well as planning to achieve goals. The two Control items were "counting on myself" and "doing what's right for me." The seven items more easily endorsed by adults seemed to reflect that they already were in the world of work. Most of the items favoring adults were on the Curiosity and Confidence subscales, with the exception of one item from the Concern scale, namely "becoming aware of choices to be made." Adults were more curious about possible options and rated themselves better at problem-solving and at performing tasks efficiently and well. Despite the differential item functioning, there was no psychometric evidence supporting the need for different forms of the CAAS for adolescents and adults (Ambiel et al., 2016).

In Macau, Tien et al. (2014) examined measurement equivalence between 270 middle school and 188 high school students. They had found that high school students scored significantly higher than did middle school students on the CAAS subscales. Thus, they used multiple-group second-order CFS to evaluate the measurement invariance for middle and senior high school models. The factor loadings were constrained to be equal across groups and then estimated simultaneously. The fit indices were $\chi^2/df = 2.16$, p < 0.05, RMSEA = 0.071, and SRMR = 0.067. After releasing the equality restrictions on the factor loadings of the two groups, the fit indices were $\chi^2/df = 2.19$, p < 0.05, RMSEA = 0.072, and SRMR = 0.055. They used a Chi-square difference test for nested models to evaluate the measurement equivalence of the two models. The Chi-square difference test ($\Delta\chi^2$ [24] = 33.22, p > 0.05) provided supporting evidence for second-order metric invariance for the different groups of students. The non-significant difference between the two models means that they fit the theoretical model equally well statistically. Thus, the data supported metric invariance for the different groups of students.

The third study was conducted in Lithuania. Urbanaviciute et al. (2014) followed a multiple-indicator multiple-cause model (MIMIC) to test for measurement invariance and differential item function of the CAAS with regard to age, gender, and place of residence. The participants were 512 high school students. The analyses showed that most of the items were invariant with regard to respondent demographic characteristics. The only exception was obtained after testing the link between CAAS items and gender: item 10 ("Tvirtai laikytis savo įsitikinimų" / "Sticking up for my beliefs") seemed to be scored higher by girls, the rest of the items were invariant across gender groups. Age and place of residence had no effect upon the variance of the CAAS – Lithuanian form factor indicators. Therefore, the items in the Lithuanian version of the CAAS can be considered to be valid in terms of socio-demographic variables.

The fourth study examined differential item functioning in one language across four countries with similar cultures. Johnston et al. (2013a) administered the CAAS to 1707 participants in France and the French-speaking regions of Belgium, Luxembourg, and Switzerland. The results of a multigroup CFA indicated that the CAAS reached scalar equivalence and was supported by the following overall model-fit statistics, $\chi^2/df = 3.08$, CFI = 0.91, TLI = 0.91, and RMSEA = 0.035. They proposed that meaningful comparisons in mean scores could be made between individuals in France and French-speaking parts of Switzerland, Belgium, and Luxembourg.

In the fifth study, McIlveen et al. (2018) examined the latent structure of the CAAS using a factor model and estimation routine appropriate for ordinal categorical data, which are tests of full measurement invariance suitable for polytomous data. They conducted three studies, the first two with participants from an under-studied population, to determine the applicability of the CAAS to the broader workforce. They examined the replicability of the CAAS factor structure among retail workers and mothers returning to work, respectively. They examined tests of invariance by comparing latent mean differences between the groups.

For the first study, the participants were 394 retail workers (72.1% females) with a mean age of 25.87 years (SD = 9.51). A range of retail categories were represented, including for example stores that sold groceries, clothing, furniture, pharmaceuticals, antiques, and motor vehicles. The test of the hierarchical model resulted in an acceptable fit to the data, with $\chi^2 = 3.50$ (p < 0.001), CFI = 0.951, TLI = 0.945, and RMSEA = 0.080. The loadings from the four CAAS factors to the higher-order adaptability factor ranged from 0.74 to 0.90. The participants for the second study were 160 women who, having worked as mothers to raise their children, were aiming to enter or

reenter the workforce. The age categories were 18-24 (5%), 25-34 (40.6%), 35-44 (38.1%), 45-54 (12.5%), and 55 and over (3.1%). The hierarchical, multi-dimensional model provided a largely acceptable fit to the data, with $\chi^2 = 2.07$ (p < 0.001), CFI = 0.931, TLI = 0.923, and RMSEA = 0.082. The loadings from the four CAAS factors to the higher-order adaptability factor ranged from 0.69 to 0.79. The third study involved as participants 344 teacher education students at a university. The CFA of the hierarchical model indicated an acceptable to excellent fit to the data, with fit indices of $\chi^2 = 2.35$ (p < 0.001), CFI = 0.966, TLI = 0.962, and RMSEA = 0.063. The loadings for the four CAAS factors to the higher-order adaptability factor ranged from 0.77 to 0.85 (McIlveen et al., 2018).

To compare results for the three groups, McIlveen et al. (2018) examined the invariance of the CAAS responses across groups of retail workers, mothers returning to work, and pre-service teachers. The first-order configural invariance model provided an acceptable fit to the data. Next, they examined the invariance of the second-order structure, with the first-order strictly invariant model serving as the baseline model from which the second-order configurally invariant model was specified. The second-order configurally invariant model provided an acceptable-to-good fit to the data. Taken together, these results (a) demonstrated the full measurement invariance of *CAAS* scores, (b) supported the multi-dimensional, hierarchical latent structure underlying responses to the CAAS in three different occupational groups, and (c) showed meaningful latent mean differences in adaptability, with the retail workers and mothers reporting lower career adaptability than the pre-service teachers (McIlveen et al., 2018).

Scoring Instructions

The CAAS contains 24-items and uses a 5-point Likert response format by which respondents rate the extent to which they have developed various abilities ranging from 1 (not strong) to 5 (strongest). The CAAS items measure the four dimensions of career adaptability with six items per dimension: Concern (ability to plan an occupational future), Control (ability to make career decisions), Curiosity (ability to explore occupational options), and Confidence (ability to deal with barriers to career decision-making). Scoring is achieved by summing the scores for each subscale, with a possible total score ranging between 6 and 30. Higher scores in each area indicate greater strength in that area. Summing all 24 items forms a total score ranging from 24 to 120 that indicates overall career adaptability. Higher total scores indicate greater career adaptability levels.

Limitations and Recommendations for Future Research

Developing the CAAS was limited by the fact that it did not demonstrate residual invariance across country contexts. While reliability was acceptable at the minimum for CAAS subscales and total scale, these values also varied across countries. Increased understanding of career adaptability and the career construction theory model of adaptation continues to progress through a series of successive approximations advanced by reflection and research. An immediate research need is the creation and validation of educational, counseling, and coaching intervention methods and materials to develop career adaptability resources among students and employees. Preliminary research suggests further examination of how intrapersonal career adaptation variables relate to interpersonal cooperation during times of career transition. This research could test the proposition that the CAAS measures internal resources activated within the self, whereas the Cooperation subscale measures external resources activated within the community. Longitudinal studies may

test whether career adaptability continues to develop during adulthood. Based on current research findings, one might conclude that career adaptability increases with age through childhood and adolescence yet does not keep developing during adulthood (Savickas & Porfeli, 2012). In adulthood, the resources may be activated and strengthened during times of occupational transitions. Developmental research could investigate the assertion by Shin and Lee (2017) that secure attachment may foster career adaptability resources and promote adapting responses. In contrast, insecure attachment may cause individuals to under-develop adaptability resources and adopt dysfunctional strategies to deal with vocational tasks, occupational transitions, and work troubles.

Current research findings suggest that career adaptability should be treated as a multi-dimensional construct whose dimensions are not mutually interchangeable and thus merit further investigation of the four adapt-abilities' differential effects regarding outcomes of interest. Future research should examine the role of the four adapt-abilities in different circumstances and outcomes. For example, what does Curiosity mean when career planning or vocational identity is high versus low. It would be useful to study the variability of profile shapes among individuals with the same level of adaptability and consider nuances of interpretation for commonly occurring distinct profiles.

Although the career adapt-abilities have commonalities, they play different roles in predicting adaptation outcomes and even suppress each other when considered in parallel. For example, the pairing of Control and Confidence seems to be more strongly related to social outcomes than does the pairing of Control and Curiosity. Another example involves time perspective, with Concern relating to future focus while Control relates to present focus. In sum, while research has done much to explain the construct of career adaptability, full understanding of its meaning, measurement, and malleability is far from complete. The construct of career adaptability will become even more comprehensible with the continued study of a number and variety of empirical and hypothetical relationships.

Conclusion

Programmatic research on career adaptability has followed a sequential strategy that progressed across five distinct stages with different research methods: survey, technique, critical, theoretical, and applied. The program of research on career adaptability began with a survey study of existing literature related to the construct of career adaptability, followed by reflection on the findings to identify dimensions of the construct and variables to which it may relate. The survey led to understanding how career adaptability differs from career maturity, its possible dimensions, proposed definitions, and place in a model of career adaptation. The second stage in the programmatic strategy involved technique research that developed an operational definition with which to make the construct of career adaptability observable, quantifiable, and measurable. This strategy produced the Career Adapt-Abilities Scale. The third stage consisted of critical research that used the inventories to establish a coherent nomological network of empirical relationships between career adaptability and related constructs. The fourth stage involved theoretical research that tested hypotheses concerning relations among adaptivity, adaptability, adapting, and adaptation. The final stage, which has begun just recently, is applied research to determine how educational, counseling, and coaching interventions might develop the career adaptability of

students and employees. Currently, the 24-item CAAS offers researchers and practitioners in multinational contexts a viable, valid, and psychometrically sound measure of career adaptability and its four dimensions of Concern, Control, Curiosity, and Confidence.

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Appendix

Career Adapt-Abilities Scale (CAAS) Scoring Key

Concern = 1-6

Control = 7-12

Curiosity = 13-18

Confidence = 19-24

CAAS items included in CAAS-Short Form:

Concern = 1, 3,and 4

Control = 8, 9, and 11

Curiosity = 14, 15, and 16

Confidence = 20, 21, and 22

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