

RESEARCH ARTICLE

Cultural Adaptation and Examination of Factor Structure, Validity, and Reliability of the Student Career Construction Inventory

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ABSTRACT

Consistent with similar cross-cultural studies, this research aimed to validate the Student Career Construction Inventory (SCCI) within the Iranian student population. Therefore, the present study aimed to investigate the psychometric properties of the Persian version of the SCCI. This inventory is designed to measure students' adapting responses. Using convenience sampling, 800 undergraduate students (582 females, 218 males) from the University of Isfahan participated in the study and completed the SCCI, the Career Adapt-Ability Scale (CAAS), and the Vocational Identity Scale (VIS). The data were randomly divided into two sample groups for exploratory factor analysis (EFA; $n = 400$) and confirmatory factor analysis (CFA; $n = 400$). EFA revealed a three-factor structure of self-concept Crystallizing, career Exploring, and Deciding-Preparing, which differs from the original four-factor structure (Crystallizing, Exploring, Deciding, and Preparing). CFA was conducted with the remaining sample ($n = 400$). Fit indices indicated acceptable fit. Convergent validity was examined and confirmed with career adaptability and vocational identity, while differential validity was assessed using the HTMT criterion. The reliability of the inventory was also confirmed using Cronbach's alpha. These findings suggest that the SCCI, with its three-factor structure, can be a useful tool for assessing adapting responses in students, providing valuable insights for both researchers and practitioners in the field of career development, particularly in collectivist educational settings.

Introduction

In the contemporary world, careers are undergoing rapid transformations due to swift technological advancements, globalization, and economic uncertainties. Consequently, individuals must continuously navigate a complex and dynamic work environment through the process of adapting to careers and taking control of their professional lives (Brewer, 2018; Hartung & Vess, 2018). To adapt to this changing work environment, individuals must first recognize their interests, abilities, values, and other personal characteristics, as well as the competencies required for the current era (Hirschi & Koen, 2021; Savickas, 2023).

Various career theories have been developed to assist in this endeavor, including Social Cognitive Career Theory (Lent et al., 2020), Career Construction Theory (Savickas, 2023), and Protean and Boundaryless Career theories (Wiernik & Kostal, 2019). These frameworks offer theoretical and practical guidance to individuals seeking to navigate the complexities of careers in a rapidly changing labor market. Among these, Career Construction Theory emphasizes the importance of adapting to changing circumstances and constructing a career path that is personally meaningful and satisfying (Savickas, 2023).

Career Construction Theory posits that individuals construct their careers through interaction with the social context by building meaning and personal narratives; the central process of this theory is adaptation, which begins with internal resources and leads to career results. From this perspective, rather than merely fitting into a job, individuals actively construct their careers through a continuous process of meaning-making (Hartung & Vess, 2023).

The Career Construction Model of Adaptation (CCMA), a core component of Career Construction Theory, offers a framework for understanding how individuals adapt to career-related challenges. The CCMA suggests that better adaptation to academic and occupational challenges may result from a chain of relationships among career adaptivity, career adaptability, adapting responses, and adaptation results (Ochoco & Ty, 2021; Savickas, 2023). Career adaptivity, the first component, refers to an individual's willingness and ability to cope with career changes. This concept has become increasingly important in today's rapidly changing society and is considered a crucial condition for success (Chen et al., 2020).

Career adaptability, the second component, refers to individuals' career self-regulation competencies. Specifically, it comprises four psychosocial resources: *Concern* (anticipating one's future role as a worker), *Control* (influencing the environment to achieve personal goals), *Curiosity* (exploring future work scenarios and possible selves), and *Confidence* (believing in one's abilities to pursue career and life aspirations) (Sulistiani & Handoyo, 2018). Adapting responses, the third component, refer to adaptive behaviors individuals enact in

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response to career environmental challenges. These behaviors include planning, exploration, decision-making, skilling, and managing changes (Hirschi et al., 2015).

Adaptation results are the fourth component, defined as the goodness-of-fit between inner needs and outer opportunities. Consequently, adaptivity, adaptability, and adapting responses lead to adaptation results. In other words, students who have the willingness to change (adaptivity) and the necessary resources to cope with career changes (adaptability) are more likely to adopt career adapting behaviors (adapting responses) that foster success, satisfaction, and development (adaptation results) (Savickas, 2023; Savickas et al., 2018). Various studies on university students have assessed the relationships between the model's components, confirming the sequence of adaptivity, adaptability, adapting responses, and adaptation results (Kara et al., 2021; Nilforooshan, 2020; Perera & McIlveen, 2017).

Different dimensions of the Career Construction Model of Adaptation have been measured using a variety of instruments. Adaptivity has been measured by tools assessing core self-evaluations, proactive personality, and cognitive abilities (Hirschi et al., 2015; Mercan & Öztemel, 2023; Nilforooshan & Salimi, 2016; Šverko & Babarović, 2019). Similarly, adapting responses have been assessed by instruments such as career planning, career decision-making self-efficacy, and career difficulties (Hirschi et al., 2015; Öztemel & Akyol, 2020; Savickas et al., 2018). The Career Adapt-Abilities Scale (CAAS) has been the instrument for measuring career adaptability, demonstrating good psychometric properties and serving as a valid and reliable tool for measuring career adaptability across various contexts (Mazahreh et al., 2017; Monteiro & Almeida, 2015; Nilforooshan & Salimi, 2016; Pouyaud et al., 2012; Urbanaviciute et al., 2014).

Johnston (2016) emphasized the need for more comprehensive and integrated measurement tools to capture the various dimensions of the Career Construction Model of Adaptation. In this regard, Rudolph et al. (2017) identified several measurement tools for adapting responses, each designed to assess a limited set of responses, such as exploration or planning. Furthermore, existing tools available to assess adapting responses—such as the Career Engagement Scale (Hirschi et al., 2015), the Career Exploration Survey (Stumpf et al., 1983), and the Career Strategies Inventory (Gould & Penley, 1984)—do not specifically cover the full measurement of the "adapting response" dimension of the adaptation model.

To bridge this gap, Savickas et al. (2018) developed the Student Career Construction Inventory (SCCI) to provide a comprehensive measurement tool. This inventory is specifically designed to measure the "adapting response" dimension of the adaptation model. The SCCI was initially developed with 25 items across five factors to capture behaviors in the exploratory stage of a career: Crystallizing a vocational self-concept, Exploring occupations, Deciding on a vocational choice, Skilling (instrumentalizing for training), and Transitioning from school to work (Savickas et al., 2018).

However, Exploratory Factor Analysis indicated a need to remove items and reduce the factors to four. Specifically, one item from Crystallizing, four from Exploring, and one each from Skilling and Transitioning were removed. Items related to Skilling and Transitioning were merged to form a single factor representing the preliminary competencies for entering a desired job. The final form of the SCCI comprises 18 items across four factors, demonstrating good fit indices and appropriate reliability among high school, undergraduate, and graduate students (Savickas et al., 2018).

Savickas et al. (2018) suggested that this inventory be examined in different countries and societies. Validating the SCCI in various countries is important for several reasons. It allows for the assessment of the student career construction process within diverse cultural contexts, which can offer insights into similarities and differences in career development across different populations and provide a basis for cross-cultural comparisons and the development of international research collaborations.

Accordingly, the SCCI has been validated in various populations, including Portugal (Soares et al., 2022), Turkey (Sevinç & Siyez, 2018), South Korea (Park et al., 2020; Kang et al., 2021), and France (Kertechian & Bester, 2023), to ensure its validity and reliability in diverse groups. This inventory has shown good psychometric properties and has been used to assess students' adapting responses (Kang et al., 2021; Kertechian & Bester, 2023; Öztemel & Akyol, 2020; Soares et al., 2022). However, it has not yet been tested in the Iranian society with its unique culture. Continuing previous research, it is essential to conduct a study to validate the SCCI in the Iranian society to eliminate the gap caused by the lack of a valid and reliable tool for assessing adapting responses in studies related to the career adaptation process and for application in the field of career counseling. Therefore, the aim of the present study is the cultural adaptation and validation of the Career Construction Inventory within the Iranian student population.

Methodology

Participants and Procedure

The research sample consisted of 800 undergraduate students from the University of Isfahan. Given that the inventory contains 18 items, the participant-to-item ratio for both exploratory and confirmatory analyses exceeded 22 to 1, indicating high statistical power and sample size adequacy. Participants were selected using convenience sampling. The sample comprised 582 females (72.8%) and 218 males (27.2%), with an age range of 19 to 40 years ($M = 21.63$, $SD = 3.25$). To ensure a diverse representation of academic experiences, participants were recruited from various disciplines, including Engineering, Social Sciences, Humanities, and Basic Sciences.

To ensure a robust and unbiased analysis, the total sample ($N = 800$) was randomly divided into two equal groups ($n = 400$ per group) using SPSS software. A stratified randomization method based on gender was employed during the process to maintain a similar gender distribution (approximately 73% female and 27% male) in both groups. This stratified randomization ensured that the factor structure derived from the Exploratory Factor Analysis (EFA) could be independently validated in the Confirmatory Factor Analysis (CFA), thereby increasing the reliability and generalizability of the findings. The split-sample approach is widely recommended in psychometric studies to avoid overfitting and to ensure that the identified factor structure is not specific to the studied sample (Bandalos & Finney, 2018).

Ethical approval for this research was obtained from the Ethics Committee of the University of Isfahan. Students participated in the study voluntarily by completing the questionnaires. Prior to data collection, participants provided informed consent and were assured of

confidentiality. They were also assured that their responses would remain anonymous and that there were no right or wrong answers. Completing the questionnaires took approximately 15 to 20 minutes.

A total of 820 students initially volunteered to participate in the study. After removing incomplete responses and cases with missing data (20 cases, equivalent to 2.44% of the initial sample), the final sample consisted of 800 participants. Statistical analyses were conducted using IBM SPSS 26 and AMOS 27 software. To ensure linguistic and cultural equivalence, the Student Career Construction Inventory (SCCI) was translated into Persian using a rigorous back-translation process.

Based on the method proposed by Brislin (2000), the process began with two Persian-speaking career counseling experts independently translating the original English version of the SCCI into Persian. Subsequently, an expert fluent in both Persian and English, who was not involved in the initial translation, back-translated these versions into English. An English speaker then reviewed and compared the back-translated version with the original English text to identify any discrepancies and ensure conceptual equivalence.

Finally, the Persian version of the SCCI was refined based on feedback from translators and reviewers to improve cultural relevance and clarity. This rigorous process ensured that the Persian version of the SCCI, while maintaining the original meaning of the items, was culturally appropriate for Iranian students

Instruments

Career Adapt-Abilities Scale (CAAS)

Adaptation resources were assessed using the Career Adapt-Abilities Scale (Savickas & Porfeli, 2012), which was standardized for the Iranian population by Nilforooshan and Salimi (2016). This questionnaire contains 24 items scored on a 5-point Likert scale. Participants were asked to indicate their level of agreement with statements such as "I can cope with unexpected events" and "I can find positive things in difficult situations" (Nilforooshan & Salimi, 2016). The CAAS comprises four subscales measuring Concern, Control, Curiosity, and Confidence.

In examining convergent validity, Nilforooshan and Salimi (2016) demonstrated that the CAAS has a significant correlation with questionnaires on career aspirations, career exploration behaviors, career decision-making, and career satisfaction. Savickas and Porfeli (2012) reported the internal consistency of this questionnaire using Cronbach's alpha as .92, and for the subscales of Concern, Control, Curiosity, and Confidence as .83, .75, .79, and .85, respectively. In the study by Nilforooshan and Salimi (2016), reliability was found to be between .74 and .89 for the subscales and .85 for the total questionnaire. In the present study, the Cronbach's alpha coefficient for the questionnaire was .91, and for the subscales of Concern, Control, Curiosity, and Confidence, it was .72, .79, .79, and .80, respectively.

Student Career Construction Inventory (SCCI-Ir)

Adapting responses were measured using the Student Career Construction Inventory (Savickas et al., 2018). The SCCI consists of 18 items scored on a 5-point Likert scale, ranging from 1 ("I have not yet thought about it") to 5 ("I have already done it"). Savickas et al. (2018) found good reliability indices among graduate students (alpha = .76-.89) and undergraduate students (alpha = .79-.92). In the present study, the Cronbach's alpha coefficient was obtained as .92.

Vocational Identity Scale (VIS)

Vocational identity was assessed using the Vocational Identity Scale (Holland et al., 1993). The VIS includes 18 items (e.g., "I am uncertain about which occupations I could perform well") with "True" or "False" response options. The VIS evaluates whether participants have a clear and stable understanding of their talents, interests, and career goals. In a study conducted by Soltanzadeh Jazi et al. (2022) on a sample of Iranian university students, a Cronbach's alpha reliability coefficient of .87 was reported for the VIS. In the present study, Cronbach's alpha for this questionnaire was obtained as .84.

Results

Initially, to examine whether the adapting responses inventory would replicate the four-factor structure, an Exploratory Factor Analysis (EFA) with Varimax rotation was conducted on the data. First, the Kaiser-Meyer-Olkin (KMO) measure was calculated to ensure sample adequacy. The KMO value was .93, indicating the suitability of the sample for factor analysis. Bartlett's Test of Sphericity was also significant ($p < .001$), indicating that the correlation matrix was appropriate for factor analysis. The EFA results revealed a three-factor structure explaining 57.4% of the total variance. An examination of the scree plot (Figure 1) and the total variance explained indicated that the first factor, Self-Concept Crystallizing, had an eigenvalue of 7.74 and explained 26% of the total variance.

The second factor, Career Exploring, had an eigenvalue of 1.34 and explained 18.40% of the total variance. The third factor, Deciding-Preparing, had an eigenvalue of 1.35 and explained 12.93% of the total variance. As shown in Table 1, nearly all factor loadings were appropriate; the lowest factor loading belonged to items 4 and 5 with a value of .55, and the highest belonged to item 8 with a value of .85. To determine the fit of the three-factor model with the data, Confirmatory Factor Analysis (CFA) was utilized.

CFA was conducted on the second half of the split sample ($n=400$) using AMOS 27 software for the Student Career Construction Inventory with three subscales: Self-Concept Crystallizing, Career Exploring, and the combined Deciding-Preparing. Two measurement models were specified. The first-order model followed a three-factor structure assuming 18 observed variables and 3 latent variables. The second-order model assumed a hierarchical structure with 18 observed variables, 3 first-order latent variables, and one second-order latent variable of Adapting Responses.

The first-order CFA was performed on the three-dimensional structure of the scale. Self-Concept Crystallizing, Career Exploring, and the Deciding-Preparing combination were considered as latent variables in this model. The values were calculated as $\chi^2 = 278.28$, $df = 126$, $TLI = .95$, $CFI = .96$, and $RMSEA = .055$ (Table 2). The results of the first-order factor analysis indicated that the three-factor model fits well. Therefore, these values correspond acceptably with good fit indices. Furthermore, standardized loadings ranged from .50 to .74. All items strongly represented the constructs to which they belonged, and all factor loadings in this model were significant.

A second-order factor analysis was also conducted to determine the hierarchical structure of the scale. As shown in Figure 2, Self-Concept Crystallizing, Career Exploring, the Deciding-Preparing combination, and overall Adapting Responses were considered latent variables in this model. The results of the second-order factor analysis showed that the model had a favorable fit. The fit indices were calculated as $\chi^2 = 281.85$, $df = 126$, $TLI = .95$, $CFI = .96$, and $RMSEA = .055$. Standardized coefficients ranged from .43 to .74. Thus, it can be stated that all items strongly represent the constructs to which they belong in the second-order factor analysis, and all factor loadings in this model are significant.

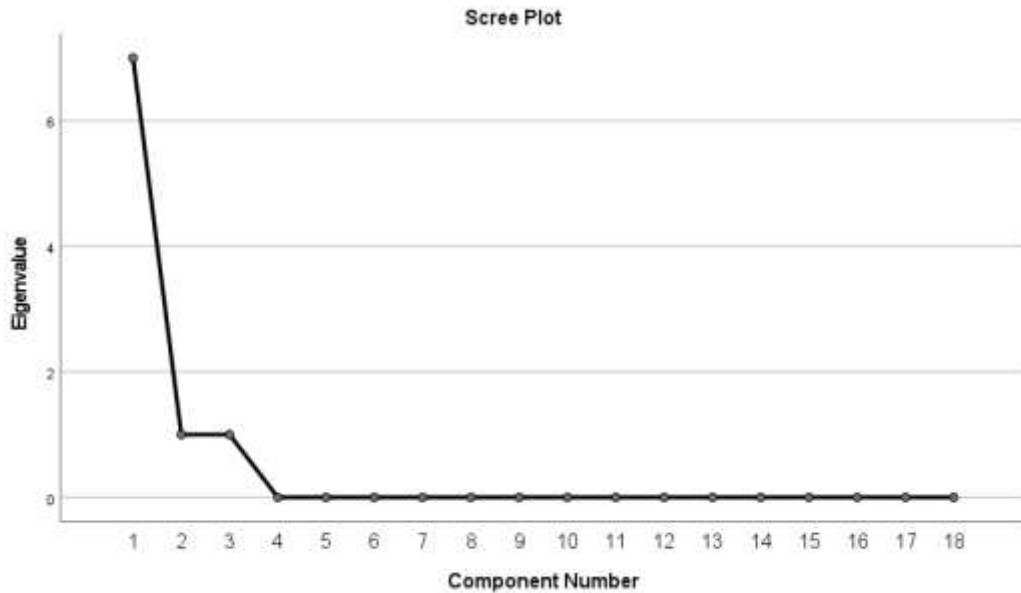


Figure 1: A diagram of the scree plot to determine the factors of the career construction questionnaire.

Table 1: Rotated matrix of the factor loadings for the 18-item scale.

SCCI items	Factor loading		
	1	2	3
Factor 1: Crystallizing			
1. Forming a clear picture of my personality.	(شکل گرفتن تصویری واضح از شخصیتم)	0.70	
2. Recognizing my interests and abilities.	(شناخت توانایی ها و استعدادهايم)	0.71	
3. Determining what values are important to me.	(تعیین کردن مهمترین ارزش هایم)	0.63	
4. Knowing how other people view me.	(آگاه بودن از دیدگاه سایرین راجع به خودم)	0.55	
5. Identifying people that I want to be like.	(مشخص کردن افرادی که می خواهم شبیه آنها باشم)	0.55	
6. Finding out what my interests are.	(پس بردن به اینکه علايقم چه هستند)	0.68	
Factor 2: Exploring			
7. Learning about different types of jobs.	(به دست آوردن اطلاعات در مورد انواع مختلف مشاغل)		0.82
8. Reading about occupations.	(مطالعه کردن در مورد مشاغل)		0.85
9. Investigating occupations that might suit me	(بررسی کردن مشاغلی که ممکن است مناسب من باشد)		0.63

SCCI items	Factor loading		
	1	2	3
Factor 3: Deciding-Preparing			
10. Deciding what I want to do for a living. (تصمیم گرفتن راجع به آنچه که واقعا می خواهم برای زندگی ام انجام دهم)			0.64
11. Finding a line of work that suits me. (پیدا کردن مسیر کاری که متناسب من است)			0.67
12. Selecting an occupation that will satisfy me. (انتخاب کردن حرفه ای که مرا ارضی می کند)			0.69
13. Planning how to get into the occupation I choose. (برنامه ریزی کردن برای چگونگی رسیدن به حرفه ای که انتخاب می کنم)			0.71
14. Reassuring myself that I made a good occupational choice. (اطمینان دادن به خودم که انتخاب حرفه ای درستی داشته ام)			0.60
15. Finding opportunities to get the training and experience I need. (پیدا کردن فرصت هایی که آموزش و تجربه ی مورد نیازم را کسب کنم)			0.68
16. Beginning the training needed for my preferred job. (شروع کردن به یادگرفتن آنچه برای شغل ترجیحی ام نیاز دارم)			0.66
17. Qualifying for the job I like best. (کسب شایستگی برای شغلی که بیشتر دوست دارم)			0.68
18. Getting a job once I complete my education or training. (بدست آوردن شغل، زمانی که آموزش یا تحصیلاتم کامل می شود)			0.70

Table 2: Overall fit indices for the three-factor and one-factor models of the career path construction questionnaire.

Model	χ^2	df	p	χ^2/df	RMSEA	CFI	TLI
Three-factor model	278.28	126	< .001	2.21	0.055	0.96	0.95
One-factor model	281.85	127	< .001	2.22	0.055	0.96	0.95

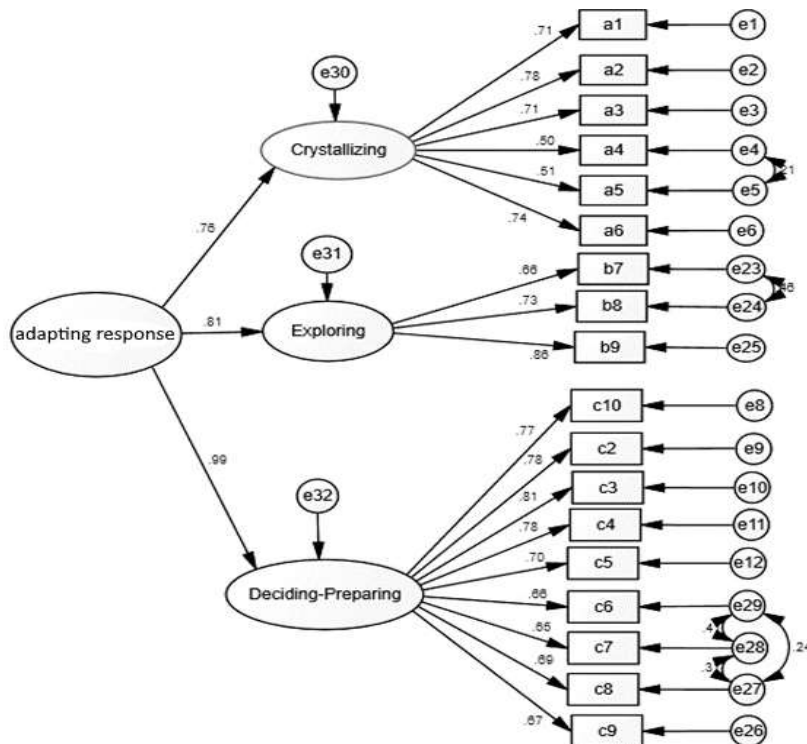


Figure 2: Confirmatory factor analysis model of the career path construction questionnaire.

Table 3 presents the means, standard deviations, Cronbach's alpha coefficients, and correlations between the dimensions of adapting responses and total scores. Self-Concept Crystallizing, Career Exploring, the Deciding-Preparing combination, and the total score of Adapting Responses had means of 3.33, 3.15, 3.25, and 3.25, respectively, with standard deviations ranging from .62 to 1.28. Cronbach's alpha values for each dimension were above .80, indicating good internal reliability of the Career Construction Inventory. Correlations between the dimensions of adapting responses were significant ($p < .001$), with coefficients ranging from .50 to .87. The highest correlation coefficient was observed between the total adaptation score and Deciding-Preparing ($r = .87$).

Table 3: Mean, standard deviation, and Cronbach's alpha – Correlation matrix of the dimensions of adaptation responses and the total score.

Variable	Mean	SD	Cronbach's α	Crystallizing	Exploring	Deciding-Preparing	Adapting Responses
Crystallizing	3.33	0.91	0.80	-	-	-	-
Exploring	3.15	1.28	0.90	0.50***	-	-	-
Deciding-Preparing	3.25	0.93	0.83	0.63***	0.62***	-	-
Adapting Responses	3.25	0.89	0.92	0.80***	0.87***	0.87***	-

*** $p < 0.001$

The findings showed that the dimensions of adapting responses are related to adaptability and adaptation results, providing evidence for the convergent validity of the SCCI. Table 4 shows the correlations between the adapting response dimensions (Crystallizing, Exploring, Deciding-Preparing) and the adaptability dimensions (Concern, Control, Curiosity, Confidence) as well as Vocational Identity as adaptation results. The results indicated that all correlations were significant ($p < .001$). Self-Concept Crystallizing, Career Exploring, and Deciding-Preparing were positively correlated with all adaptability dimensions, total adaptability, and total adaptation in the range of .25 to .50.

Furthermore, total adapting responses were positively correlated with all adaptability dimensions, total adaptability, and total adaptation within the range of .37 to .48. These findings indicate that adapting response dimensions are related to adaptability and adaptation, providing evidence for the convergent validity of the Career Construction Inventory. Also, to assess convergent validity, Average Variance Extracted (AVE) and Composite Reliability (CR) values were examined. As observed in Table 5, AVE values for the dimensions of Self-Concept Crystallizing, Career Exploring, and Deciding-Preparing were .46, .60, and .53, respectively, and CR values were above .80, indicating appropriate reliability of the questionnaire.

Although the AVE value for the Career Self-Concept Crystallizing dimension was slightly lower than the recommended threshold of .50, it is still considered acceptable. Therefore, it can be concluded that the Career Construction Inventory has good structural consistency and convergent validity according to the criteria proposed by Byrne (2023). Furthermore, according to Black and Babin (2019), CR values must exceed the AVE threshold of .50 to ensure the convergent validity of the scale. The values reported in Table 5 met the recommended criteria. Overall, the AVE and CR values presented in Table 5 support the validity and reliability of the Career Construction Inventory.

Table 4: Correlation between the dimensions of adaptation responses and adaptability.

Variable	Crystallizing	Exploring	Deciding-Preparing	Adapting Responses
Concern	0.37***	0.30***	0.47***	0.44***
Control	0.31***	0.25***	0.41***	0.37***
Curiosity	0.32***	0.34***	0.37***	0.41***
Confidence	0.30***	0.27***	0.39***	0.37***
Adaptability Total	0.40***	0.36***	0.50***	0.48***
Adaptation Total	0.45***	0.30***	0.45***	0.45***

*** $p < 0.001$ ($n=800$)

Divergent Validity

Divergent validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio (Table 5). According to the Fornell-Larcker criterion, divergent validity is established when the square root of the AVE for a construct is greater than its correlation with other constructs. However, the Fornell-Larcker criterion has recently been criticized, and a new method called the HTMT index is used to assess divergent validity (Henseler et al., 2014).

In the present study, divergent validity was not fully established using the Fornell-Larcker criterion; however, when assessed using the HTMT index, all ratios were lower than the required threshold of .85. Therefore, divergent validity is established. Collectively, the AVE and CR values presented in Table 5 provide further evidence for the validity and reliability of the Career Construction Inventory.

Table 5: Convergent and discriminant validity.

Variable	CR	AVE	HTMT		
			Crystallizing	Exploring	Deciding-Preparing
Crystallizing	0.83	0.46	-	-	-
Exploring	0.81	0.60	0.72	-	-
Deciding-Preparing	0.90	0.53	0.45	0.73	-

Note. CR = Composite

Discussion and Conclusion

The present study aimed to examine the validity and reliability of the Persian version of the Student Career Construction Inventory (SCCI). The SCCI was developed to measure thoughts and behaviors related to career adaptation, thereby addressing the need for a reliable instrument to assess adapting responses (Savickas et al., 2018). In this study, Exploratory Factor Analysis revealed a three-factor structure consisting of Crystallizing, Exploring, and an integrated Deciding-Preparing factor. Following the exploratory analysis, two measurement models were specified: a three-factor model and a hierarchical model. The three-factor model (comprising Crystallizing, Exploring, and Deciding-Preparing) was confirmed by Confirmatory Factor Analysis and demonstrated appropriate fit indices. The hierarchical model (comprising factors of Crystallizing, Exploring, Deciding-Preparing, and Adapting Responses) also fitted the data well. The internal reliability of the SCCI was satisfactory, with Cronbach's alpha values ranging from .80 to .92.

The criterion validity of the questionnaire was confirmed through significant correlations between the dimensions of adaptation (Crystallizing, Exploring, Deciding-Preparing) and the dimensions of adaptability (Concern, Control, Curiosity, Confidence) as well as adaptation results. This finding aligns with results from other studies, including Kertechian and Bester (2023), Soares et al. (2022), and Savickas et al. (2018), which reported significant relationships between adaptation and other measures of career adaptability. Furthermore, the differential validity of the questionnaire was confirmed by the HTMT ratio, with all values falling below the .85 threshold.

These findings are consistent with previous studies that have validated translations of the questionnaire in other cultural contexts, such as Korea (Kang et al., 2021), France (Kertechian & Bester, 2023), China (Jiang et al., 2022), Portugal (Soares et al., 2022), and Turkey (Öztemel & Akyol, 2020). The obtained three-factor model aligns with results from studies conducted in Turkey (Sevinç & Siyez, 2018) but differs from the original four-factor model validated in Portugal and South Korea (Soares et al., 2022; Kang et al., 2021).

In the validation process within the French student population, the original four-factor structure was also retained (Kertechian & Bester, 2023), suggesting a potential association driven by cultural orientation. Specifically, more collectivist societies (Iran and Turkey) show a greater tendency to merge factors, whereas individualist cultures (France and Portugal) maintain separate factors. South Korea represents an interesting exception to this trend, which may be attributed to its rapid modernization and hybrid cultural characteristics.

The integration of the Deciding and Preparing factors into a single factor within the Iranian student sample is a significant finding that can be interpreted through various cultural and systemic reasons. In cultures with collectivist traits, such as Iran, major life choices, including career paths, are less of an individual and exploratory process and more of a family-social decision. Expectations of parents and the social status of occupations often predetermine or at least outline a specific career path for the individual.

In such a context, the decision-making stage shifts from open and free exploration toward a process of verifying and accepting a pre-existing option. Simultaneously, the country's educational system, particularly through the National Entrance Exam (Konkur), reinforces this process. By obtaining a rank and selecting a major, the student effectively makes a long-term career decision at the very beginning of university entry. As the student consolidates their decision, they must simultaneously acquire the necessary tools to realize it; thus, this factor integration is not an anomaly but a logical adaptive strategy in response to a cultural and systemic structure where deciding and preparing are intertwined.

As noted, this finding aligns with the research of Sevinç and Siyez (2018) in Turkey but contradicts the findings of Soares et al. (2022) and Kertechian and Bester (2023) in Portugal and France, where decision-making and preparation are considered separate processes. Iran's centralized educational system, similar to that of Turkey, involves selecting a major at a young age, which effectively combines the stages of decision-making and preparation.

Systemic challenges within the Iranian educational system, such as limited opportunities for practical training and work experience, also reinforce this merger of factors. This traditional focus on theoretical knowledge (Moosavi et al., 2017; Mahmoudi et al., 2020) creates a gap between academic preparation and workplace expectations. This pattern contrasts with findings by Kang et al. (2021) in South Korea, where strong links between industry and education make the boundaries between decision-making and preparation stages less permeable.

The results of this study can be beneficial for researchers and practitioners in the field of career development, as they can assist in identifying individuals who are more adaptable and better equipped to navigate the changing world of work. Indeed, these results contribute significantly to Career Construction Theory by highlighting the necessity of attending to the variable of career adapting responses within cultural and educational systems. For practitioners, the SCCI offers a tool tailored to the Iranian culture, and the integrated Deciding-Preparing factor serves as a reminder that integrated intervention protocols addressing decision-making and preparation skills simultaneously may be required.

These findings emphasize the importance of adopting culturally sensitive counseling approaches in the career domain without losing the theoretical integrity of Career Construction Theory. Given the confirmed validity and reliability of the instrument, it is suggested that career counselors and university counseling centers use this inventory to assess students' levels of adapting responses—including crystallizing, exploring, and deciding—to design targeted counseling interventions based on individual needs. Furthermore, the results of this research can serve as a basis for designing and evaluating the effectiveness of educational workshops aimed at enhancing school-to-work transition skills and career readiness in students.

Limitations and Future Research

Despite significant results, this study faced limitations that should be considered when interpreting the findings. First, sampling was done using a convenience method and was limited to students of a single university; this warrants caution regarding the generalizability of results to the entire student population of the country with its cultural diversity and various academic contexts. Second, this research utilized a cross-sectional design, which does not allow for the examination of causal relationships or the study of the evolution of career construction

behaviors over time. Finally, data collection was conducted via self-report questionnaires, which may be influenced by response bias or social desirability.

The use of qualitative methods, such as focus group interviews, could provide deeper insights into students' career construction processes and their understanding of the adaptive responses measured by the SCCI. Third, the Deciding-Preparing factor was not examined in depth in this study. Future research should investigate the specific processes and interactions involved in these two stages to gain a better understanding of how they influence career adaptation in collectivist cultures. Finally, longitudinal studies are essential to assess the stability of the three-factor structure over time and to examine how students' adapting responses evolve during their studies and upon entry into the labor market.

Ethical Considerations Participants provided verbal consent to participate in the research, and they were assured regarding the confidentiality of their information. The present study holds the ethics code IR.UI.REC.1400.020 from the University of Isfahan.

Authors' Contribution The lead author conducted all research stages under the guidance of the supervisor and advisor and is responsible for writing the article.

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