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Developing and validating career sustainability scale: sample of Turkish university students

Osman Söner[1*] and Hazel Duru[2]

Abstract

Purpose This study aimed to develop and validate the University Students Career Sustainability Scale-Turkish Sample (US-CSS-TR) to assess university students' perceptions of career sustainability within the Turkish context. The research sought to establish the scale's validity and reliability while examining its relationships with job-finding anxiety, work volition, and proactive career behavior.

Methods The study followed a quantitative research design, collecting data from undergraduate students at various state and foundation universities in Istanbul. The scale development process included exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to assess structural validity. Measurement invariance tests were conducted across gender groups, and correlation network analyses were performed to examine the relationships between career sustainability and relevant career development factors. Statistical analyses were conducted using SPSS, AMOS, JASP, and JAMOVI.

Results EFA and CFA confirmed a unidimensional structure for the US-CSS-TR, demonstrating strong internal consistency and reliability (Cronbach's alpha = 0.911 to 0.920). Measurement invariance analyses indicated that the scale was invariant across gender groups. Correlation analyses revealed that proactive career behavior had the strongest positive association with career sustainability perceptions, followed by work volition, while job-finding anxiety had a negative but non-significant relationship with career sustainability. Network analysis further highlighted the central role of proactive career behavior and work volition in shaping career sustainability perceptions.

Conclusion The study provides empirical evidence supporting the US-CSS-TR as a valid and reliable instrument for assessing career sustainability perceptions among Turkish university students. Findings suggest that proactive career behavior and work volition are key contributors to career sustainability development. The study underscores the importance of proactive career planning and adaptability in career sustainability, offering valuable insights for career counseling and educational interventions.

Keywords Career sustainability, Scale validation, Measurement invariance, Turkish sample

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Introduction

The rapidly changing economic, technological, and social dynamics in today's business world make individuals' career processes more uncertain and complex. These changes make it necessary for individuals not only to acquire a profession but also to build a career sustainability in the long term. In this context, career sustainability is critical for individuals to maintain their careers in a successful, meaningful, and balanced manner in the long term. The concept of "sustainability" has recently become one of the prominent research topics [1, 2]. Various researchers have focused on the social dimensions of sustainability, including various aspects of employees' work lives (work-life balance, job satisfaction, etc.) [3, 4]. The non-linear and unpredictable structure of today's careers, shaped by accelerated socio-economic developments and uncertain employment processes, necessitates that individuals adopt sustainable career strategies [5–7]. The COVID pandemic, which has global effects, has also brought about various disruptions in employees' work processes [8]. This pandemic has put individuals into a worldwide unemployment crisis [9]. Therefore, many individuals are currently employed in insecure, temporary jobs with unsatisfactory employment conditions [10]. Accordingly, individuals must have the necessary skills and strategies to build a career sustainability in a changing business world for their well-being and development.

Career sustainability has become a significant concern for individuals and society due to the increasing number of career options [11]. Researchers working in career development have increasingly emphasized the importance of economic and workplace changes that have made the work lives of many individuals unpredictable and will continue to do so shortly [12, 13]. Considering the globalization of the industry, mergers or downsizing of workplaces, and the increasing incorporation of artificial intelligence technologies into work processes, critical issues related to career sustainability arise [14, 15]. University students transitioning from school to work life are at a pivotal stage in their career development. Their ability to make sound career decisions plays a critical role in shaping sustainable professional trajectories [16–18] Career sustainability can be conceptualized as a dynamic and adaptive process comprising four interrelated components: resourcefulness, flexibility, renewability, and integration across different life domains [19]. This model enables individuals to cope with change, maintain their career identity over time, and align their work with evolving personal and contextual demands. It supports sustained career engagement and psychological well-being in the long term.

Theoretical framework

Various definitions and interpretations exist of the concept of "career sustainability" due to different contextual influences such as regional, economic, and global factors, existing conditions in the labor market, local government policies, and societal norms [20]. These different definitions and interpretations pave the way for more research in career sustainability and for the subject to attract more attention. In recent years, studies on career sustainability have become increasingly important [19, 21]. Defined as a dynamic interactional structure shaped by the individual, the environment, and time, career sustainability emphasizes long-term adaptability and continuity across life domains [19]. The model consists of four interrelated dimensions—resourcefulness, flexibility, renewability, and integration—which help individuals remain employable and fulfilled in the face of changing life and work conditions. It also demonstrates the benefits of psychological resources for career sustainability [22]. Different researchers have defined career sustainability in various ways. For example, De Hauw and Greenhaus (2015) described career sustainability as a career in which individuals are productive, healthy, happy, and employable throughout their lives while adapting to more diverse life contexts [23]. According to Greenhaus and Ernst Kossek (2014), the important characteristics of a career sustainability are that it provides sufficient economic security for the individual, is compatible with the values of the individual's career, can be shaped according to the needs of the individual, and provides continuous renewal opportunities for the individual [24]. McDonald and Hite (2018) state that interdependence, resilience, longevity, and social justice are among the elements of a career sustainability [25]. While these earlier models offer valuable contributions, this study adopts a framework that operationalizes career sustainability based on four key dimensions, building on Newman's (2011) foundational structure [19, 26]. In this model, "resourcefulness" was added to the original structure of flexibility, renewability, and integration, emphasizing an individual's ability to earn a stable income now and in the future [19]. Rather than viewing career sustainability as a fixed trait, the model defines it as an interactional and developmental process, where individuals actively construct and renew their careers through the interplay of personal agency and environmental context [19, 26]. In developing their model, Chin et al. (2019) developed a four-factor model based on Newman's (2011) model and added the dimension of resourcefulness [19, 26]. Given the changing business environment, Resourcefulness is critical for career sustainability. It enables an individual to earn a stable income now and in the future [19]. In addition, Chin et al. (2019), within the framework of the model they present, reveal that career sustainability are an interactional

structure by stating that career sustainability is a characteristic of careers and the people who have settled in these careers [19]. In this context, career sustainability depends on resourcefulness development at some point [27]. Chin et al. (2022) explain that career sustainability has four dimensions: resourceful, flexible, renewable, and integrative [19]. Career sustainability involves a dynamic relationship between the individual, the environment, and time. These four dimensions are conceptualized as interrelated competencies and environmental capacities that shape sustained engagement, adaptability, and well-being across the career lifespan [19, 26, 27]. These elements can contribute to shared goals for the survival of employees and organizations and development in a rapidly changing employment market, societies, and globally [28]. In this sense, adopting a career sustainability perspective helps individuals align their current needs with long-term career goals and outcomes [29]. Career sustainability also plays a key role in environments where proactive characteristics can be expressed. Kim et al. (2024) argue that individuals in the middle period of their career development and facing career transition processes should increase sustainability by developing and constantly renewing their careers [29]. From this point of view, they developed a measurement tool to ensure sustainability in employees' career development and to objectively measure the career sustainability of employees between the ages of 40 and 55, considering career transition processes. This measurement tool has four dimensions: perception of career sustainability, skill acquisition for career sustainability, relationship building for career sustainability, and environmental awareness for career sustainability [29]. In addition, Russo et al. (2023) conducted qualitative research from a different perspective on career sustainability. As a result of the study, they expanded the concept of a sustainable career. They included personal factors such as subjective success, satisfaction, physical and mental well-being, good performance, productivity, and expressions such as improving social conditions and social empowerment in the concept framework [30]. Thus, according to this model, career sustainability is a career that improves the quality of life of individuals and societies [31]. Despite the diversity of conceptualizations in the literature, the present study operationalizes career sustainability based on a multidimensional framework due to its clarity, practical applicability, and emphasis on proactive individual–environment interaction [19].

Career sustainability, gender, and education

In our study, we also included the gender of the participants and the educational status of their parents. These socio-demographic variables were considered relevant in shaping attitudes toward career sustainability, although they have rarely been examined in prior research [32]. Indeed, some studies have shown that students whose parents have a university education have higher levels of self-efficacy when making educational plans [33, 34]. When comparing developed and developing countries, one of the most significant distinctions lies in educational attainment, which plays a vital role in employability, health outcomes, and social development [35, 36]. Based on these, our study hypothesized that the parents' educational level of university students transitioning to work may have a supportive or inhibitory effect on the sustainability of their careers. In addition, Udayar et al. (2024) found that gender is an important variable in career sustainability [37]. Their findings indicated that being female and lacking higher education increases the likelihood of having a fragmented career. In our research, we wanted to address the gender variable in terms of a career sustainability.

Career sustainability and work volition

The recent economic fluctuations in Turkey, austerity measures, and the rapid inflation increase have brought various economic difficulties. According to data from the Central Bank of the Republic of Turkey (2025), there was a total change of 569.68% in the inflation rate from April 2020 to April 2025 [38]. Duffy et al. (2016) explain that economic constraints encompass individuals' financial resources [39]. The COVID-19 pandemic has further intensified these economic challenges. Individuals who were in high school (14–18 years old) during the pandemic are now transitioning from university to the workforce (18–22 years old), facing compounded difficulties. Blustein et al. (2019) emphasize that individuals without sound economic backgrounds face significant challenges throughout their career development [40]. Economic constraints may reduce the likelihood of individuals accessing quality education during high school [41]. As a result, when individuals move into adulthood, they may have fewer opportunities to pursue suitable careers and may struggle to secure stable employment [39]. In Özgül's (2023) study with university students, it was determined that students also have future anxiety and economic barriers [42]. At this point, the work volition comes to the fore. The will to work is the perceived capacity of individuals to fulfill their career choices despite the constraints they face [43]. Duffy et al. (2016) conceptualized the will to work as a central construct that refers to individuals' ability to secure a good and satisfying job [39]. Indeed, Ma et al. (2020) found that economic constraints are negatively related to university students' work willpower and perceptions of having a good job in the future [44]. Additionally, volitional behaviors are associated with sustainability-oriented attitudes and actions [45]. In this context,

we argue that volitional behaviors support university students' career sustainability.

Career sustainability and job finding anxiety

Job anxiety refers to university students' feeling anxious about not finding a job and fearing the possible consequences of unemployment [46]. In recent years, concerns about job finding have intensified due to recession, economic instability, rising youth unemployment, and the constantly evolving nature of work life [47, 48]. At the same time, when the literature is examined, it is seen that there is the concept of "career anxiety" in parallel with the anxiety of finding a job. It can be mentioned that one dimension of career anxiety is the anxiety of "finding a job-employment". Tsai et al. (2017) stated that negative beliefs about employment processes, employment conditions, and whether the education received meets the expectations of business life are some factors that constitute career anxiety [49]. This form of anxiety is linked to key career outcomes such as career indecision, reduced exploration, and diminished commitment [45, 46, 50]. Based on all these, it seems critical to have information about the nature and possible effects of job finding anxiety, which is a dimension of career anxiety. When the literature is examined, it is seen that almost no studies address the relationship between job finding anxiety and a career sustainability. In this context, Moore (2019) concluded that support mechanisms for sustainable employment are important for young people to reduce unemployment rates [51]. Career sustainability reflects three key characteristics: providing renewal opportunities, fostering flexibility and adaptability, and integrating different life domains and experiences [21]. In this context, we aimed to explore whether perceptions of career sustainability are significantly associated with anxiety about job finding.

Career sustainability and proactive career behavior

According to old paradigms of career development, the transition from school to work entails a lifetime of one-off employment [49]. However, young people who will be employed in the new era should be able to adapt to recent changes and the globalizing world [21Proactive career behaviors—such as planning, exploration, networking, and skill development—enable individuals to manage their transitions effectively and take ownership of their careers [52, 53]. These behaviors support career development and transitions in this process [7]. In addition, proactive career behaviors are important in reducing stress, increasing life satisfaction, and bringing positive career-related outcomes [54]. Such outcomes—including happiness, productivity, and job satisfaction—are key indicators of career sustainability [7]. Despite this relevance, studies on how young people structure career sustainability remain limited [55, 56]. However, some studies have revealed that proactive career behaviors positively correlate with career sustainability [21, 56]. Talluri et al. (2022) found that the effect of proactive career behaviors and career adaptability on career sustainability was significant in their mediation model [7]. Based on these findings, we hypothesize that there is a meaningful relationship between university students' proactive career behaviors and their perceptions of career sustainability.

Context of career sustainability in Turkey

Individuals need careers where they can feel lifelong productivity, demonstrate their performance, and where their personal goals and careers are in line. A sustainable career supports consistent performance and meaning across time, guided by core dimensions such as resourcefulness, flexibility, renewability, and integration [19]. Organizations want to have a good and educated workforce instead of individuals who are not successful in keeping up with the latest developments, renewing themselves, and improving their skills, as these individuals will not support the competitiveness of the organizations. Therefore, career sustainability is of practical importance for individuals, societies, and organizations [27]. The literature on careers has paid particular attention to the analysis and study of career sustainability [57]. Based on this situation in the literature, in the current study, we focused on how the concept of a career sustainability can be addressed in Turkish culture and developed a scale in this direction. In this way, academic demands for the idea of a career sustainability are responded to [21, 58].

Turkey has recently adopted different employment practices due to fluctuations in the economic field. Recent public policies in Turkey limit the employment of employees in the public sector as part of austerity measures. "Except for the fulfillment of the obligatory obligations arising from the law, it will be possible to request the creation or use of new cadres and positions up to the decrease in the number of cadres and positions in the previous fiscal year due to reasons such as retirement, resignation, and death." [59]. These policies may result in challenges that differ from those encountered in other countries. For example, young people perceive their education as wasted and unnecessary, or seek occupations that provide easier financial gain. Although the items in the scale we developed are grounded in a theoretical framework, they were also designed by considering the potential challenges that young individuals may face. Considering that recent public policies in Turkey are likely to affect individuals about to enter the labor market, this study aims to develop a scale to measure the career sustainability characteristics of university students currently undergoing the school-to-work transition. The

difficulties and barriers in employment processes and the low future expectations among the youth in Turkey may lead to significant challenges regarding developing career sustainability. For example, the 2023 Life Satisfaction Survey conducted by the Turkish Statistical Institute (TurkStat) found that 42.7% of participants expected their lives to remain the same, while 27.8% expected it to worsen. Among 18–24-year-olds, only 51.8% described themselves as happy [60]. Considering these factors, both the difficulties and obstacles in employment processes and the low future expectations of the young population in Turkey may cause them to experience problems in terms of career sustainability. In this context, developing a culture-specific scale is necessary to understand university students' perspectives on career sustainability during their career transition process and offer appropriate support services based on these insights. In addition, when the literature is examined, it is stated that positive work-life events affect career sustainability to a greater extent than negative life events at or outside work [37]. Although a scale has been developed for employees [61] in Turkish culture, there is no measurement tool for university students transitioning from university to work life. Therefore, this study introduces a new measurement tool based on the same theoretical framework to assess career sustainability characteristics in this younger population.

The scale development and validation process was carried out across three independent studies with separate samples, strengthening its reliability and construct validity. This multi-sample design enhances the methodological rigor of the University Students Career Sustainability Scale – Turkish Sample (US-CSS-TR).

Purpose of the study

It is valuable to conduct culture-specific research to broaden the perspectives of young prospective employees in Turkey on career sustainability and to contribute to work contexts that will positively affect their career sustainability. In addition, this research may be functional in providing a culture-specific measurement tool for career counseling professionals to provide services to individuals with problems with career sustainability. The scale development and validation process was structured across three independent studies involving separate samples to establish the reliability and construct validity of the University Students Career Sustainability Scale-Turkish Sample (US-CSS-TR). This design contributes to the scale's methodological rigor by allowing cross-validation across different participant groups. Based on this, the hypotheses of this study are as follows:

H_1. The Turkish version of the Career Sustainability Scale (US-CSS-TR) shows satisfactory psychometric properties such as internal consistency, construct validity, and factorial structure in a sample of university students. *(Tested in Study 1 and Study 2)*

H_2. The US-CSS-TR shows measurement invariance across gender groups, suggesting that the scale functions equally for male and female participants. *(Tested in Study 3)*

H_3. Perceived career sustainability is significantly related to job finding anxiety (negative), work willpower (positive), and proactive career behavior (positive). *(Tested in Study 3)*

H_4. Career sustainability may also vary according to gender and age variables. *(Tested in Study 3)*

Method

Research design

A Turkish sample is used in this study to investigate the validity, reliability, and measurement invariance of the University Students Career Sustainability Scale-Turkish Sample (US-CSS-TR) using a cross-sectional survey approach. The study evaluates the scale's concept validity and internal consistency using accepted psychometric validation techniques [62, 63].

Study groups

The study group of this research consists of undergraduate students from different states and foundation universities in Istanbul. There are differences between public and foundation universities in Istanbul in terms of educational approach, variety of academic programs, and resources offered. However, within the scope of this study, these institutional differences were not examined in depth; only a general participant profile was created. In this context, the characteristics of the groups from which data were collected are presented in Table 1. Study 1 shows the demographic characteristics of the participants who participated in the survey for exploratory factor analysis, study 2 shows the demographic characteristics of the participants collected for confirmatory factor analysis, and study 3 shows the demographic characteristics of the participants who participated in the study for correlation and measurement invariance. Since Study 3 had a larger sample size designed explicitly for correlational and invariance analyses, conducting gender measurement invariance analysis using Study 3 data was considered more appropriate.

According to Table 1, the demographic information of the university students in the Study 1 group was analyzed in terms of gender, grade level, and mother and father education level. In this group, male students ($f = 98$, 34.1%) were underrepresented, while female students ($f = 189$, 65.9%) were overrepresented. In terms of grade level distribution, first-grade students ($f = 37$, 12.9%) and second-grade students ($f = 36$, 12.5%) had the lowest rates, while third-grade students ($f = 149$, 51.9%)

Table 1 Demographic information by data collection groups

	Study 1		Study 2		Study 3	
	f	%	f	%	f	%
Gender						
Male	98	34,1	106	40,5	167	38,6
Female	189	65,9	156	59,5	269	61,7
Grade Level						
1st Grade	37	12,9	62	23,7	62	14,2
2st Grade	36	12,5	87	33,2	112	25,7
3st Grade	149	51,9	69	26,3	170	39
4st Grade	65	22,6	44	16,8	92	21,1
Mother's Education Level						
Illiterate	21	7,3	19	7,3	26	6
Primary School	84	29,3	78	29,8	129	29,6
Secondary School	54	18,8	51	19,5	87	20
High School	82	28,6	65	24,8	115	26,4
University	46	16	49	18,7	79	18,1
Father's Education Level						
Illiterate	9	3,1	6	2,3	10	2,3
Primary School	61	21,3	54	20,6	95	21,8
Secondary School	46	16	51	19,5	76	17,4
High School	79	27,5	85	32,4	134	30,7
University	92	32,1	66	25,2	121	27,8

constituted the highest rate, followed by fourth-grade students (f = 65, 22.6%). Regarding maternal education, literate mothers (f = 21, 7.3%) had the lowest rate, while mothers who graduated from primary school (f = 84, 29.3%) had the highest rate. Regarding fathers' education, literate fathers (f = 9, 3.1%) were represented at the lowest rate, while university graduates (f = 92, 32.1%) had the highest rate.

The gender distribution of the demographic information about the students in the Study 2 group is closer to a balanced structure. Male students (f = 106, 40.5%) were underrepresented, while female students (f = 156, 59.5%) constituted most of the group. By grade level, 2nd-grade students (f = 87, 33.2%) represented the largest group, followed by 3rd-grade students (f = 69, 26.3%), 1st-grade students (f = 62, 23.7%), and 4th-grade students (f = 44, 16.8%). Literate mothers (f = 19, 7.3%) and university graduates (f = 49, 18.7%) were underrepresented regarding maternal education. Primary school graduate mothers (f = 78, 29.8%) were represented at the highest rate. Regarding the father's educational status, literate fathers (f = 6, 2.3%) had the lowest rate, while university graduates (f = 66, 25.2%) had the highest rate.

In Study 3, female students (f = 269, 61.7%) were more represented than male students (f = 167, 38.6%). In terms of grade level, 3rd-grade students (f = 170, 39%) constitute the largest group, followed by 2nd-grade students (f = 112, 25.7%), 4th-grade students (f = 92, 21.1%), and 1st-grade students (f = 62, 14.2%). When the mother's education level was analyzed, literate mothers (f = 26, 6%) were represented at the lowest rate, while mothers who graduated from primary school (f = 129, 29.6%) had the highest rate. Regarding the father's educational status, literate fathers (f = 10, 2.3%) were represented at the lowest rate, while high school graduates (f = 134, 30.7%) constituted the highest rate. University graduate fathers (f = 121, 27.8%) comprise the second highest group.

Data collection tools

Personal information form The personal information form prepared by the researcher aimed to determine some demographic characteristics. This form includes gender, age, mother's education level, father's education level, and grade level.

University students career sustainability scale-Turkish sample (US-CSS-TR) The development of the University Students Career Sustainability Scale-Turkish Sample (US-CSS-TR) was informed by a theoretical understanding of career sustainability as a multidimensional and dynamic concept. The initial item pool was generated through an extensive literature review on career sustainability, adaptability, and long-term career well-being. In line with the theoretical framework, an initial set of 21 items was created to capture various dimensions of career sustainability. Expert reviews were conducted to establish content validity. After pilot testing, the scale underwent item analysis based on item-total correlations and exploratory factor analysis (EFA). According to DeVellis (2016), expert opinion is the process of receiving feedback on the

appropriateness of the items from individuals who work on the research topic as a way to increase content validity [62]. In this context, the questionnaire was submitted to the opinions of two experts in the field of Career Counseling from the Department of Guidance and Psychological Counseling, who have national and international studies in the field of Career Counseling and hold a PhD degree in the relevant field, and one expert from the Department of Psychology, who has national and international studies in the field of Industrial and Organizational Psychology and holds a PhD degree in the relevant field. In addition, the items were checked by an expert from the Turkish department to determine whether the items complied with Turkish grammar rules. Based on the feedback from the experts, the number of items was reduced to 19. These 19 items were pre-tested with a group of 16 university students. During the pre-testing, the comprehensibility of the items, clarity of the expressions, and printing errors were noted; the average response time for each item was set as 15–20 min. As a result of the preliminary test, the scale was finalized by removing items that were not understood or deemed unnecessary. Then, the trial form was applied. In addition, considering the feedback received from experts, the pre-application, and the capacity of university students to express fine distinctions more precisely, the use of a 7-point Likert type (1- Strongly Disagree, 7- Strongly Agree) was used because it allows for more sensitive measurements by increasing the variance of responses and strengthens the suitability of parametric statistics in data analysis [64]. During the applications, voluntary participation was ensured, and detailed explanations about the scale were given to the participants before the application. In these explanations, information was given about the purpose of the scale, the content of the items, and the method of answering. All corrections were made during the trial application. As a result, four items were removed due to low factor loadings or redundancy, reducing the number of items to 19. Subsequently, confirmatory factor analysis (CFA) was performed, leading to a final 12-item unidimensional structure with strong psychometric properties. For transparency and ease of cross-cultural evaluation, the English wording of all items — including the initial 21 items and the final 12-item version — is presented in Appendix A and Appendix B.

Proactive career behavior scale This measurement tool was developed by Hirschi et al. (2014) and translated into Turkish by Korkmaz et al. (2020) [53, 65]. The Turkish adaptation of the scale was conducted on university students. The scale consists of nine items and one dimension. In addition, the scale is a five-point Likert scale (1 - Rarely, 5 - Very often), and the higher the score obtained from the scale, the higher the proactive career commitment. Goodness of fit values [$\chi 2 = 118.117$, df = 24, $p < .001$; CFI = 0.95; TLI = 0.93; RMSEA = 0.09 (90% C.I. = 07.-0.11); SRMR = 0.06] were determined in the analysis of the scale. The scale's Cronbach Alpha internal consistency coefficient was calculated as 0.88. The correlation calculated from the test-retest applied four weeks apart was moderate and significant ($r = .67$, $p < .001$). The item-total correlations of the scale were found to vary between 0.49 and 0.80. The Cronbach's alpha reliability coefficient of the scale for this study was re-examined and found to be 0.896. In addition, confirmatory factor analysis and goodness of fit values were re-examined for this study, and it was found that these values were within acceptable ranges [$\chi^2/df = 3.952$, CFI = 0.966, GFI = 0.955, RMSEA = 0.080, SRMR = 0.040].

Work volition scale This measurement tool was developed by Duffy et al. (2012) and translated into Turkish by Büyükgöze-Kavas and Ünal (2019) [43, 66]. The adaptation of the scale was conducted on university students. The scale has 16 items and two sub-dimensions: structural barriers and financial barriers. In addition, the scale is a seven-point Likert-type scale (1 - Strongly Disagree, 7 - Strongly Agree), and the higher the score obtained from the scale, the higher the work volition. Goodness of fit values [CFI = 0.96, TLI = 0.95, RMSEA = 0.048, 90% CI = 0.026 – 0.067, SRMR = 0.049] were found in the analysis of the scale. Cronbach's alpha internal consistency coefficient was 0.86 for the total score, 0.82 for the financial barriers subscale, and 0.72 for the structural barriers subscale. The Cronbach's alpha reliability coefficient of the scale for this study was re-examined and found to be 0.865. In addition, confirmatory factor analysis and goodness of fit values were re-examined for this study, and it was found that these values were within acceptable ranges [CFI=0.912, GFI=0.911, RMSEA=0.077, SRMR = 0.044].

Job finding anxiety scale This measurement tool was developed by Gül-Şanli et al. (2023) to determine university students' anxiety about finding a job [67]. Two separate sample groups were used in the development of the scale. Exploratory Factor Analysis (EFA) was conducted on the first sample (456 students), and it was determined that the scale had a single-factor structure with 10 items explaining 45% of the total variance. In addition, the scale is a four-point Likert-type scale (1-Disagree, 4-Agree), and the higher the score obtained from the scale, the higher the anxiety about finding a job. Factor loadings ranged between 0.45 and 0.80, the Kaiser-Meyer-Olkin (KMO) value was found to be 0.90, and Bartlett's Test of Sphericity was significant, indicating that the data were suitable for factor analysis. Confirmatory Factor Analysis (CFA) was conducted on the second sample (862 students), and the model was found to have good fit values

(χ^2/df = 3.55, CFI = 0.97, RMSEA = 0.05). The CFA results confirmed the one-factor structure determined by EFA. The scale's reliability was tested with Cronbach's alpha coefficients and found to be 0.85 and 0.88 in both samples, respectively. The Cronbach's alpha reliability coefficient of the scale for this study was re-examined and found to be 0.877. In addition, confirmatory factor analysis and goodness of fit values were re-examined for this study, and it was found that these values were within acceptable ranges [χ^2/df = 4.278, CFI = 0.943, GFI = 0.935, RMSEA = 0.079, SRMR = 0.047].

Data collection process

The researchers obtained the necessary ethical permission for the scale development study with the November 29, 2024 decision. They numbered 2024-11 of the Social and Human Sciences Research and Publication Ethics Committee of the university with which they are affiliated. After the ethical permission, the scales were distributed to the students who wanted to participate in the study, and data were collected based on the principle of volunteerism. The researchers collected the data face-to-face. During the application, the researchers informed the participants about the purpose of the study. Participants completed the scales in an average of 25 min. The data collection process was carried out in three stages. The collected data were used for exploratory factor analysis in the first stage (November 30- December 5, 2024). Then, the data collection phase was started again to verify the determined structure (December 8 - December 15, 2024). The third stage began after the structure found by exploratory factor analysis was confirmed by confirmatory factor analysis (December 17, 2024 - December 30, 2024). In this stage, the work volition scale, job-finding anxiety scale, and proactive career behavior scales were applied together with the developed measurement tool. Correlation and measurement invariance analyses were conducted in the third stage with the collected data.

Data analysis

Statistical Package for the Social Sciences (SPSS, Statistical Package for the Social Sciences), AMOS (Analysis of Moment Structures), JASP, and JAMOVI statistical package programs were used to analyze the data. First, the data were analyzed for missing values and outliers. Then, the reliability and validity of the scale were investigated. With the data collected in the first stage (Study 1), KMO and Barlett's Sphericity tests were examined to determine whether the data were suitable for factor analysis, and it was determined that these findings were appropriate. Then, the factor loading values of the items were examined, and eigenvalues were calculated. Item discrimination was reviewed to determine the extent to which the items in the measurement tool could measure the desired feature. In this context, the difference between the item mean scores between the lower 27% and upper 27% groups according to the scores of the measurement tool was examined by an independent t-test, and this relationship was found to be insignificant, as expected. These analyses were performed with the SPSS program. SPSS was primarily utilized for basic data cleaning, descriptive statistics, item discrimination analysis, and exploratory factor analysis due to its practicality and widespread acceptance in psychometric studies. Then, McDonald's ω, Cronbach's Alpha, and Guttman's Lambda values were examined to determine the internal reliability of the measurement tool. In addition, CR and AVE values were calculated to determine the measurement tool's construct reliability and convergent validity. These values were found to be within the desired ranges. After the exploratory factor analysis of the measurement tool was found to be within the desired ranges, data were collected again from different groups in the second stage to verify (Study 2) this structure. Confirmatory factor analysis was performed with the collected data, and goodness of fit values were examined. The CFA for Study 2 data was conducted using AMOS to confirm the factor structure identified in Study 1. These values were also found to be within the desired ranges, and the third stage of the research was started. In the third stage, data were collected again from different groups (Study 3). First, the AMOS program was used to analyze the measurement invariance of the tool according to gender. Specifically, the measurement invariance analyses (configural invariance, structural equivalence, metric equivalence, and scalar equivalence) were conducted using the Study 3 dataset, not Study 2, as the Study 3 sample was larger and more suitable for multi-group comparisons. AMOS was specifically chosen for confirmatory factor analysis and measurement invariance tests because it provides advanced modeling capabilities and is considered a standard tool for structural equation modeling. Multiple group analyses were performed in this program. In this context, configural invariance, structural equivalence, metric equivalence, and scalar equivalence were analyzed, and it was seen that measurement invariance was achieved. Finally, to determine the relationship between career sustainability and gender, age, anxiety about finding a job, work volition, and proactive career behavior, the relationship was examined with the JAMOVI statistical program with 95% lower and upper confidence intervals. Correlation analyses for Study 3 data were conducted using JAMOVI to efficiently compute Pearson correlations and their confidence intervals, adhering to APA reporting guidelines. JAMOVI was utilized for correlational analyses because it offers an intuitive interface and enables the computation of confidence intervals for correlation coefficients more efficiently than SPSS, which was essential for

meeting the reporting standards of this study. Network analysis was performed with the JASP statistical program to explore this relationship's internal dynamics. Network analysis is a powerful method to visualize and understand the relationship between variables. This type of analysis is beneficial for examining the internal dynamics of complex constructs such as career sustainability. The analysis identifies positive (blue lines) and negative (red lines) correlations, revealing which factors are supportive or inhibitory. Furthermore, identifying centrally located variables allows us to understand these variables' effects on others and test the validity of theoretical models. Network analysis was also performed on Study 3 data using JASP, which provided user-friendly visualization options to illustrate the complex interrelationships among the study variables. JASP was employed for network analysis because it provides user-friendly and visually detailed network plots that are unavailable in SPSS or JAMOVI. Therefore, different programs were strategically chosen to leverage their specific strengths at different stages of the analysis.

Findings

Results of exploratory factor analysis and construct validity (study 1)

After the expert opinions, the 21-item measurement tool, which provided content validity, was pretested with 16 participants, and the incomprehensible items of the scale were corrected. Similar items were removed, and a data set of 19 items was obtained for the actual application. Findings regarding KMO, Barlett's test, item factor loadings, and eigenvalues of the career sustainability scale are presented in Table 2.

According to Erkuş (2016), many factor extraction methods have been found to assess whether the data set is suitable for factor analysis [68]. These include the creation of the correlation matrix, Barlett's test, and Kaiser-Meyer-Olkin (KMO) tests. Accordingly, the suitability of the data set for factor analysis was tested first. The KMO test assesses whether the data is suitable for factor analysis. Above 0.90 indicates a perfect fit. Bartlett's Test of Sphericity tests whether the correlations between variables are significant. A significant result shows that factor analysis can be performed. In this study, KMO was 0.922, and Bartlett's Test of Sphericity was significant ($p < .01$). According to these results, the data set was accepted as suitable for EFA [69, 70]. This study determined the minimum acceptable value for factor loading as 0.40 [62]. Items with loadings above this threshold were included in the factor structure. The factor loading values of all items in the scale were between 0.554 and 0.834, indicating that the items had a strong relationship with the relevant factors. The data and results show that there are high correlations between the variables. In other words, the data set is suitable for factor analysis.

Eigenvalue statistics are used to determine the number of factors. As seen in Table 2, the scale has a unidimensional structure, and its eigenvalue is 6.187. The variance explained by the unidimensional structure was found to be 51.556%. Tavşancıl (2014) stated that 40% and 60% variance ratios are ideal [71]. The variance ratio of 51.556% obtained in this study is within the ideal range.

Findings related to item discrimination (study 1)

At this stage, discrimination studies were conducted to determine to what extent the items in the measurement tool could measure the trait to be measured. The item discrimination index (D) shows how much the items discriminate against individuals about the measured trait. In other words, it is the power of the scale to distinguish between individuals with a high level of the trait it aims to measure and individuals with a low level of the trait. The item discrimination index can vary between – 1 and

Table 2 Item factor loadings, item total correlations, eigenvalues, KMO, and barlett's test results of the career sustainability scale

Old Item No	New Item No	Item Factor Load Value	Item Total Correlation	Eigenvalues	Variances	KMO	Barlett Sphericity Test	
							$\bar{x}$	*p*
2	1	0,694	0.698	6.187	51.556	0.922	1753.154	0.000
4	2	0,604	0.619					
5	3	0,554	0.581					
6	4	0,723	0.726					
9	5	0,772	0.756					
10	6	0,801	0.786					
11	7	0,699	0.698					
12	8	0,834	0.818					
13	9	0,711	0.715					
14	10	0,732	0.728					
18	11	0,690	0.697					
19	12	0,756	0.751					

+1. The item inversely discriminates individuals regarding the measured trait when this value is negative. Therefore, such items should be removed from the test [71]. The item discrimination value can be found by testing the differences between the item mean scores of the lower 27% and upper 27% groups formed according to the total scores of the test using an independent t-test [72].

In the item discrimination study, the participants' total scores were calculated and ranked from highest to lowest. Then, considering the (27%) value, the cut-off was applied to 170 participants from the top (highest scores) and 170 participants from the bottom (lowest scores); thus, 340 participants were obtained from 2 groups, 170 participants per group. Independent t-tests were performed for the upper and lower groups, and when the differences between the groups were analyzed, the results were found to be significant for all items ($p = .000$). These procedures were also applied to each subscale; the results are shown in Table 3.

As seen in Table 3, the item discrimination values of the scale consisting of 12 items and a single dimension were examined. The relationships between the scale's total score and the sub-dimension's total scores were significant. This shows that the items on the scale adequately measure the trait to be measured. In addition, it was determined that each sub-dimension exhibited a consistent structure within itself. These findings reveal that the scale is appropriate in terms of measurement validity.

Findings related to confirmatory factor analysis (study 2)

CFA was performed to determine which factor the obtained items were more related to and to test whether the identified factors adequately represented these variables. The resulting path diagram is shown below.

According to the confirmatory factor analysis findings in Fig. 1, the chi-square value [$\chi 2 = 131.283$ df = 52, $p < .01$] of the Career Sustainability Scale was significant. The ratio of the chi-square value to the degrees of freedom is 2.525. A value of less than 5% indicates that the fit index of the model is good [73]. One way to increase the fit values of the scale is to create covariance [73]; therefore, covariance was created between some items. The fit values of the Career Sustainability Scale are as follows: [CFI = 0.951, NFI = 0.922, RMSEA = 0.076, SRMR = 0.039]. In this context, it can be said that the fit values of the place attachment scale obtained with CFA are a good fit [74–80].

Measurement invariance findings related to gender (Study 3)

With the data obtained from the study group, multigroup CFA was applied to reveal whether the career

Table 3 Findings related to item discrimination

New Item No	Old Item No	Groups	x̄	Sd	t	*p*
1	2	Lower Groups	4,4545	1,31335	-10.471	0.00
		Upper Group	6,3766	0,93244		
2	4	Lower Groups	4,6883	1,17271	-8.845	0.00
		Upper Group	6,2727	1,04675		
3	5	Lower Groups	4,4286	1,38059	-7.785	0.00
		Upper Group	6,0260	1,12360		
4	6	Lower Groups	4,2208	1,30408	-12.396	0.00
		Upper Group	6,4805	0,92637		
5	9	Lower Groups	4,8701	1,33131	-11.926	0.00
		Upper Group	6,7792	0,44790		
6	10	Lower Groups	5,0260	1,41397	-10.500	0.00
		Upper Group	6,8052	0,45995		
7	11	Lower Groups	4,3766	1,35762	-11.895	0.00
		Upper Group	6,4935	0,77159		
8	12	Lower Groups	4,9740	1,47768	-11.111	0.00
		Upper Group	6,8961	0,34734		
9	13	Lower Groups	4,3247	1,28187	-12.802	0.00
		Upper Group	6,5325	0,80434		
10	14	Lower Groups	4,7792	1,28374	-11.409	0.00
		Upper Group	6,6364	0,62637		
11	18	Lower Groups	4,3377	1,37277	-11.670	0.00
		Upper Group	6,4416	0,78629		
12	19	Lower Groups	4,8442	1,31854	-11.316	0.00
		Upper Group	6,7143	0,60387		

Note. $\bar{x}$: Mean, Sd: Standard Deviation

*$p < .05$

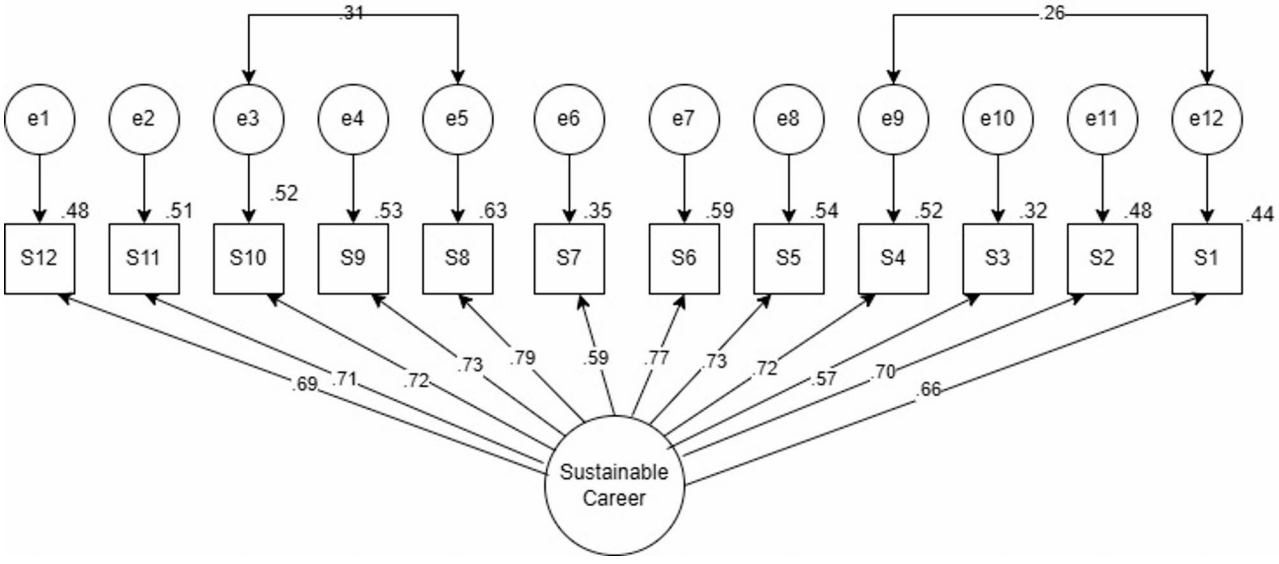

Fig. 1 Confirmatory Factor Analysis Model for career sustainability

Table 4 Measurement invariance and fit values of the career sustainability scale

Model Tests	Model Fit Criteria			Model Difference Statistics			
	χ^2	df	RMSEA	CFI	$\Delta\chi^2$	Δdf	ΔCFI
Individual groups							
Females	185.827	54	0.080	0.914			
Males	132.206	54	0.083	0.929			
All groups	252.995	54	0.082	0.924			
Configural İnvariance	571.127	162	0.054	0.922			
Structural equivalence	589.508	186	0.050	0.923	18.81	24	0.001
Metric equivalence	586.522	184	0.050	0.923	15.395	22	0.001
Scalar equivalence	586.522	184	0.050	0.923	15.395	22	0.001

sustainability scale for university students has measurement equivalence in terms of male and female groups. Table 4 shows the measurement equivalencies obtained.

Table 4, regarding the measurement invariance analysis of the career sustainability, examines the construct validity and fit of the scale across gender groups (women, men, and all groups). According to the table, fit indices are calculated separately for each group, and statistics on model differences are presented. For example, for all groups, χ^2 = 252.995, df = 54, RMSEA = 0.082, CFI = 0.924. For configural invariance, χ^2 = 571.127, df = 162, RMSEA = 0.054, CFI = 0.922 were reported. In the structural equivalence, metric equivalence, and scalar equivalence analyses, the ΔCFI value between the fit indices was 0.001, and this difference was within acceptable limits. Specifically, in the structural equivalence analysis, the model difference statistics indicated $\Delta\chi^2$ = 18.81 with Δdf = 24 and ΔCFI = 0.001, suggesting that constraining factor loadings to be equal across groups did not significantly worsen model fit. The CFA results show that a better fit was achieved due to the modifications made by correlating the error variances of the two items between the female and male groups. In the structural equivalence analysis, the fit indices (χ^2 = 241.51, df = 80, RMSEA = 0.076, CFI = 0.94) were acceptable when the parameters were free. These findings indicate that the Career Sustainability Scale provides measurement invariance between different groups and does not carry statistically significant differences.

Reliability analyses (study 1 and study 2)

Cronbach's Alpha, McDonald's ω, and Guttman's Lambda internal reliability coefficients of each dimension were calculated to determine the internal reliability of the instrument. In addition, CR and AVE values were calculated to determine the construct reliability and convergent validity of the measurement tool, and the results are presented in Table 5.

As seen in Table 5, AVE (Average Variance Extracted) and CR (Composite Reliability) values were also calculated to assess the validity and reliability of the measurement tool. An AVE above 0.50 indicates that the factor has a good explanatory power.CR assesses a factor's internal consistency, similar to Cronbach's Alpha. A

Table 5 Reliability information of the career sustainability scale for study 1, study 2, and study 3

	Study 1 (*n* = 282)	Study 2 (*n* = 262)	Study 3 (*n* = 446)
McDonald's ω	0.914	0.922	0.915
Cronbach's Alpha	0.911	0.920	0.884
Guttman's Lambda	0.877	0.888	0.846
CR	0.927	0.933	0.924
AVE	0.516	0.538	0.468

CR above 0.70 indicates that the factor is reliable [81]. CR values above 0.70 in the first, second, and third applications indicate high reliability. AVE values above 0.50 in all three applications indicate that these factors have a good explanatory power.

Reliability analysis results show that the scale has a high level of reliability in terms of internal consistency. McDonald's ω values (0.914, 0.922, and 0.915) support the construct validity and consistency of the scale and are particularly consistent with Cronbach's Alpha (0.911, 0.920, and 0.884). McDonald's ω, as an alternative to Cronbach's Alpha that does not rely on the equal weight assumption, provides a more sensitive assessment of scales [82]. Guttman's Lambda values (0.877 and 0.888) confirm that the overall reliability of the scale is high but show a more conservative result than McDonald's ω and Cronbach's Alpha [83]. These results support the idea that the measurement tool can be used reliably in scientific research.

Relationship analysis (study 3)

First, descriptive information about the variables examined was tested with SPSS 26. In addition, the relationship coefficient and confidence intervals of the career sustainability scale with gender, age, anxiety about finding a job, work volition, and proactive career behavior were analyzed with the JAMOVI program, and the results are presented in Table 6.

As seen in Table 6, when the relationships between the Career Sustainability Scale and other variables were examined, the most substantial positive relationship was found with proactive career behavior, and the confidence interval of this relationship was found to be quite narrow ($r = .565$, 95% CI = [0.482,0.638], $p < .001$). This narrow confidence interval indicates the stability of the relationship and the strong effect of proactive career behavior on a career sustainability. A positive relationship was found between work volition and a career sustainability ($r = .261$, 95% CI = [0.149, 0.370], $p < .001$), suggesting that work volition is a significant determinant of a career sustainability. This confidence interval indicates that the relationship is of low to moderate strength.

There was no statistically significant relationship between age and career sustainability ($r = .074$, 95% CI = [-0.043, 0.189], $p = .125$), but a positive trend was observed. The fact that the confidence interval contains zero indicates that the relationship is insignificant. Similarly, no significant relationship was found between the gender variable and career sustainability ($r = .020$, 95% CI = [-0.097, 0.137], $p = .682$), which confirms that the scale does not differ according to gender. A negative relationship was found between anxiety about finding a job and a career sustainability (r= -033, 95% CI = [-0.148, 0.082], $p = .492$), but this relationship was not statistically significant. The confidence interval includes zero, indicating that the relationship is insignificant and may be coincidental.

Network analysis was performed with JASP to depict this relationship, and the results are presented in Fig. 2.

The network analysis in Fig. 2 shows the relationships between important variables for sustainable career development. The blue lines representing positive correlations reveal particularly strong links between proactive career behavior (PCB), work volition (WV), and career sustainability (SC). The thickest blue line between PCB and SC points to the critical role of proactive career behavior in building a sustainable career. On the other hand, the red lines representing negative correlations show that the link between job-finding anxiety (JFA) and work volition (WV) emphasizes the negative impact of anxiety on work volition. The thinner red and pink lines indicate the subtle but present negative effects of age and gender on some variables. Overall, this network analysis highlights the fundamental roles of proactive career behavior and work volition in sustainable career development while showing the mitigating effect of job-finding anxiety.

Table 6 Relationship of career sustainability with job finding anxiety, work volition, proactive career behavior, gender, and age

	Range	x̄	Sd	Skew.	Curt.	Correlations with Career Sustainability		Confidence İntervals	
						r	*p*	95% CI Upper	95% CI Lower
Career Sustainability	12–84	67,37	10,708	−0.709	1.002	-	-	-	-
Gender	1–2	1,38	0,488	-	-	0.020	0.682	0.113	0.074
Age	17–47	21,78	3,820	-	-	0.074	0.125	0.166	0.021
Job Finding Anxiety	10–40	27.36	7,430	−0.333	−0.634	-0,033	0.492	0.166	-0,021
Work Volition	16–112	81,64	15,44	−0.272	−0.165	0.261	< 0.001	0.346	0.171
Proactive Career Behaviour	9–45	36,28	5,830	−0.589	0.653	0.565	< 0.001	0.626	0.498

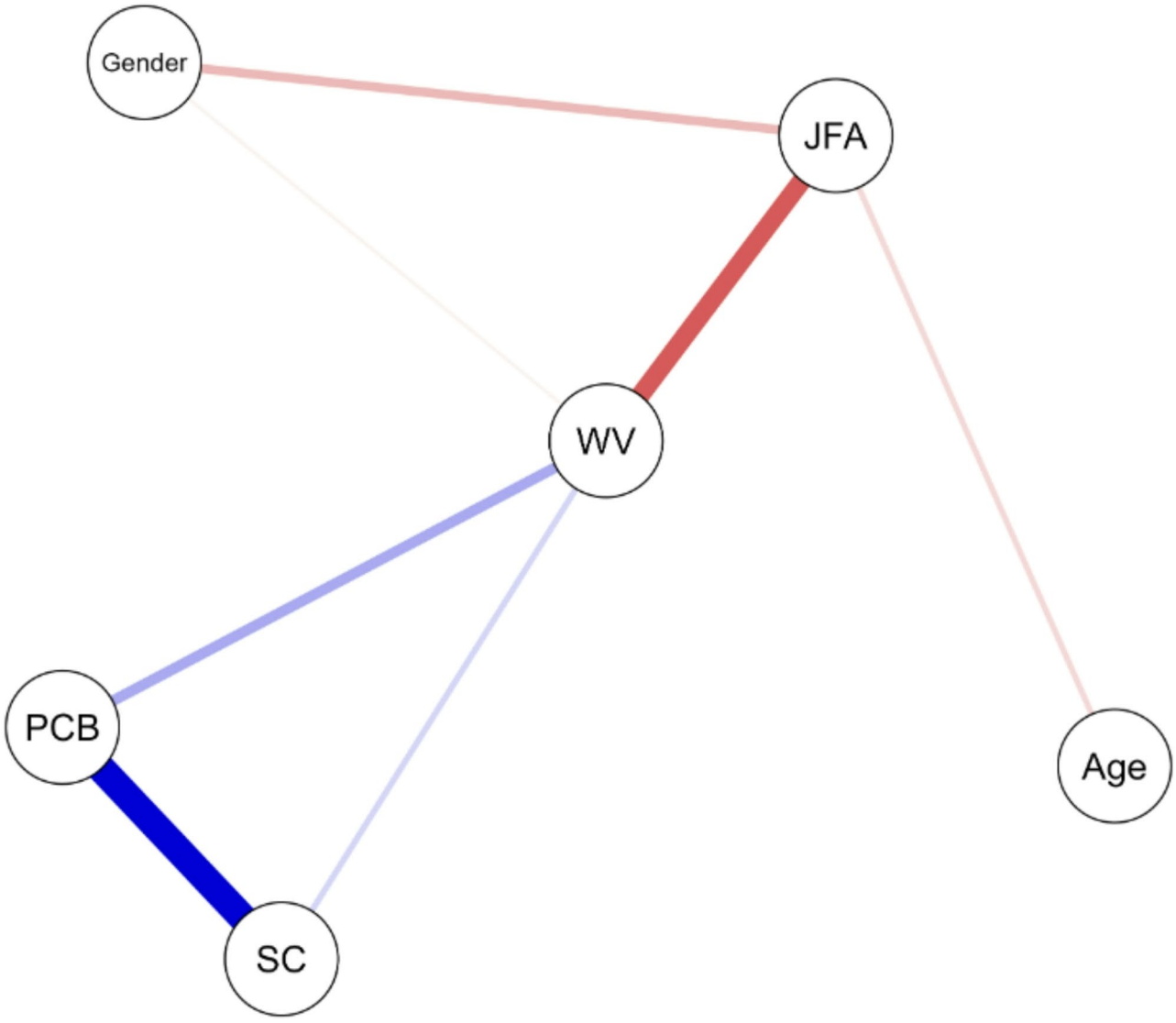

Fig. 2 Network analysis for a career sustainability. Blue lines represent positive correlations, and red lines represent negative correlations. Note. PCB: proactive career behavior; WV: work volition; SC: career sustainability; JFA: job-finding anxiety

Discussion and conclusion

To effectively assess university students' attitudes towards career sustainability, this study provided various validity and reliability evidence for the "Career Sustainability Scale (US-CSS-TR)" in the Turkish population. We developed the CSS and presented validity evidence by validating the scale's factor structure and assessing whether it showed the expected relationships with other variables related to career development. Additionally, we tested the scale we developed in the context of Turkish culture for the first time. We designed a valid and reliable measurement tool that can be used in future studies. Our results showed that the single-factor structure of the CSS was a good fit for measuring perceptions of career sustainability.

Our study found that CSS has a strong positive and significant relationship with proactive career behavior. In other words, proactive career behavior strongly affects a career sustainability. This finding aligns with theoretical perspectives suggesting that career sustainability is shaped by individuals' resourcefulness, adaptability, and proactive engagement with their career environments [19]. From this point of view, the CSS we developed is related to positive variables in measurements related to career development. In this context, it is suitable for its purpose. There are also studies in the literature that support the results of our study. Lent et al. (2024) concluded that basic proactive career behavior is important and effective in career sustainability [84]. Pekaar and Demerouti (2023) found a significant positive relationship between perceived sustainable work activities and

proactive sustainability work behaviors [85]. In their study, Talluri et al. (2022) found that the effect of proactive career behaviors and career adaptability on career sustainability was significant in their mediation model [7]. Lawrence et al. (2017) emphasize that to increase career sustainability, employees should be proactive in this context, which will ensure career continuity through lifelong learning [86]. Career commitment is the level of proactive behaviors that individuals exhibit to develop their careers. Behaviors such as career planning, networking, and skill development during career development and preparation can also be expressed as proactive career behavior [87]. These behaviors are closely related to adaptive components of career sustainability, particularly resourcefulness and flexibility, reflecting the practical relevance of such constructs. It is an inevitable necessity for individuals to improve their competencies for career sustainability. To increase their competencies, it is important that they can make their career planning effective. Individuals may lay the foundation for career sustainability by developing proactive behaviors. Positive career behaviors serve as an important prerequisite for career sustainability.

Another result of our research is a moderately positive relationship between work volition and career sustainability. No study examining the relationship between career sustainability and work volition was found when the literature was examined. Work volition is the capacity of an individual to make professional choices despite existing constraints [65]. As can be seen, the work volition refers to an individual's ability to make effective choices despite adverse conditions. In addition, career sustainability also includes the individual's ability to adapt to employment conditions, to be compatible with their career and values, to be open to innovations, and so on. The dimension of adaptability within career sustainability shares conceptual ground with work volition, particularly in individuals' readiness for career-related challenges. In this study, we present the first findings on the role of work volition in the perception of career sustainability. As a matter of fact, in parallel with the results of our study, Su et al. (2023) concluded in their study that the work volition mediates the relationship between contextual constraints and decent working conditions [88]. Ma et al. (2020) found that economic constraints are negatively related to university students' work willpower and perceptions of having a good job in the future [44]. Similarly, Kwon (2019) concluded that the direct effect of work volition on employability and its indirect effect through career adjustment are significant [89]. Turkey's economic instability, the fact that public policies are based on austerity measures, and the fact that inflation is not stable and is constantly on the rise bring along a number of economic difficulties. According to data from the Central Bank of the Republic of Turkey (2025), there was a total change of 569.68% in the inflation rate from April 2020 to April 2025 [38]. The spread of this fluctuating process over a five-year period may have caused young people who have reached the employment stage to adopt these processes. From this point of view, young people may have adapted to the existing problems, accepted the problems, and focused on their competencies and capacities related to their career choices. Consequently, they may believe that these perspectives based on adaptation and acceptance will support sustainability in their careers.

As another result of our study, we found a negative but non-significant relationship between anxiety about finding a job and career sustainability. When the literature was examined, we realized that no study addresses the relationship between anxiety about finding a job and career sustainability. In this context, Moore (2019) concluded that support mechanisms for sustainable employment are important for young people to reduce unemployment rates [51]. University students in Turkey may think that employment conditions and public policies will not change in the long run. Therefore, even if young people are aware of the employment process, they may believe they are unlikely to be employed, even if their anxiety about finding a job decreases. Public policies and employment conditions in Turkey fluctuate during political election periods. Since these periods occur every 4–5 years, young people may believe that reduced anxiety about finding a job is not supported by career sustainability, based on the stagnant processes in employment.

Based on all these, CSS fills an important gap in career counseling, especially in the Turkish sample. In addition, when the literature is examined, it is seen that there are no studies directly related to career sustainability, will to work, and proactive career behaviors. With this scale development study, the first findings on which factors can be developed and associated with career sustainability have been determined, and the basis for other studies has been established.

Implications and future directions

Our study offers a series of suggestions for both practitioners and researchers. First, this study ensured the validity and reliability of the Turkish version of the CSS (US-CSS-TR). In the adaptation of this measurement tool to different cultures and in future studies, field experts can especially use this measurement tool to determine the perceptions of employees and prospective employees about career sustainability. Organizations and companies can benefit from this scale while recruiting according to their expectations and current employment conditions. At the same time, it may be functional to organize information seminars for employers on career sustainability

and explain the critical role of sustainability in the career development process. Given that the CSS was developed with reference to theoretical understandings of career sustainability—including core elements such as resourcefulness, flexibility, renewability, and integration—it provides a useful framework to assess competencies that are increasingly important for career resilience in complex labor markets [19].The other variables of our study (work volition and proactive career commitment) should also be addressed in the literature to understand the attitudes towards career sustainability in evaluating employee candidates in the employment processes in Turkish culture. Future studies can also examine how these variables align with the theoretical components of career sustainability, especially focusing on how volitional and proactive capacities contribute to resourcefulness and long-term adaptability. In addition, in future studies, researchers can investigate how career sustainability is related to various factors of positive psychology (e.g., hope, emotional intelligence) and how they affect career sustainability. Within the scope of our study, we have included the variables of job search anxiety and proactive career behaviors. We will work in a field related to career sustainability. However, the number of studies addressing the relationship between career sustainability and these variables is almost negligible. In addition, in future studies, researchers can address the antecedents of career sustainability in terms of other factors related to career development. Based on the results obtained, psychoeducation programs can be prepared and implemented in universities' career centers to expand the perspectives of university students and recent graduates on career sustainability and use the factors affecting this concept to contribute to their career development. This study also addressed other career concepts that positively affect the perception of sustainable careers. However, empirical research linking these variables to the career sustainability construct remains limited and should be expanded. In future studies, programs based on these can be created, and their effectiveness can be tested through experimental studies. In future studies, researchers can investigate what other variables may be effective in developing career sustainability perception and include variables from positive psychology (e.g., emotional intelligence, hope, etc.). Finally, the perceptions of individuals studying in different departments and working in different sectors about career sustainability can be tested in more extensive and diverse samples and compared.

Limitations

Our study has a few limitations. The US-CSS-TR was designed for university students, and its applicability was limited to university students in this study. In addition, the career sustainability scale in the context of the study was prepared considering the current conditions, and the change of the concept over time should not be ignored. Within the scope of our study, we included the variables of job finding anxiety and proactive career behaviors. We will work in a field related to career sustainability. However, the number of studies addressing the relationship between career sustainability and these variables is almost negligible. Therefore, we invite future researchers to conduct studies on the antecedents and consequences of career sustainability. The last limitation of our study is that we used a convenience sampling method. In future studies, researchers can utilize random sampling methods. In our study, we did not consider those who intend to work in the private sector and those who intend to work in the public sector as homogeneous. However, this factor may affect the perception of career sustainability. The differences between these two groups can be examined in the following study. Finally, although Study 3 provides a large enough sample for correlation and measurement invariance analyses, the gender distribution is not perfectly balanced. Therefore, gender measurement invariance was performed using Study 3 data, and this choice is explained in the methodology section and considered a limitation of the study.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s40359-025-03346-z.

Supplementary Material 1

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Author contributions
HD conceptualized and designed the research and obtained the required permissions. OS collected the data and performed the statistical analyses. HD reviewed the analyses. Both HD and OS drafted and revised the manuscript.

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Data availability
The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study was conducted by the principles of the Declaration of Helsinki and was approved by the Bursa Uludag University Human Research Ethics Committee (Approval Decision No. 29.11 2024–2024/11). Data collection commenced upon the completion of ethical approvals and the requisite legal authorizations. At the onset of the study, participants were provided with comprehensive information regarding the nature of the study, privacy policy, and conditions of participation using written informed consent to participate, which was obtained from all participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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