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The sustainable career scale (SCS): development, validity, reliability and invariance

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Abstract

Purpose – The concept of a "sustainable career" has gained significant attention in recent academic literature, extending beyond mere professional success, encompassing elements of happiness, health, productivity and social empowerment. This study aims to develop and validate the sustainable career scale (SCS) to measure this multidimensional construct, including the innovative dimension of "social empowerment," which emphasizes the importance of responsibly addressing global needs and challenges.

Design/methodology/approach – The research comprises five studies with distinct objectives: Study 1 focuses on item development and latent structure verification; Study 2 confirms the factorial structure; Study 3 assesses concurrent and discriminant validity; Study 4 examines predictive validity and reliability; and Study 5 measures gender invariance.

Findings – Results demonstrate the validity and reliability of the SCS items and structure. Concurrent and discriminant validity are supported by analyzing relationships with work engagement, meaning, employability, burnout, decent work and job satisfaction. Additionally, the scale shows reliability and predictive validity in forecasting eudaimonic, hedonic and social well-being. Gender invariance is confirmed.

Research limitations/implications – Future research could explore its applicability across diverse contexts. The SCS has significant implications for researchers and practitioners, serving as an assessment tool to advance research in sustainable career development and guide interventions to improve careers that address global needs and foster responsible management practices.

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Data availability statement and deposition: The data that support the findings of this study are openly available in open science framework (OSF) storage linked to the preregistration of the study at the following link: https://osf.io/nda3p/.

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Originality/value – The SCS stands out as the first measure to integrate a truly sustainable perspective, encompassing societal and global contexts within the framework of career sustainability. The findings enhance the understanding of sustainable careers and demonstrate the empirical robustness of the SCS.

Keywords Sustainable career scale, Career sustainability, Social empowerment, Measurement, Sustainable career development

Paper type Research paper

Introduction

The concept of sustainable careers has emerged as a crucial response to the evolving dynamics of the contemporary labor market, which impose a reevaluation of traditional career paradigms. Socioeconomic factors, including heightened business complexity and globalization (Hall *et al.*, 2018), propelled by digital transformation (Hanelt *et al.*, 2021), have ushered in a landscape marked by diverse forms of employment and alternative work arrangements (Spreitzer *et al.*, 2017; Barley *et al.*, 2017). Furthermore, the profound disruptions brought about by events such as the COVID-19 pandemic have fundamentally altered the nature of work, impacting aspects like occupational status, remote work practices and career mobility (Kramer and Kramer, 2020). These shifts have rendered traditional, linear career models obsolete, necessitating the introduction of novel concepts such as the "sustainable career" to capture the fluid and dynamic nature of contemporary career trajectories. Unlike the conventional career paradigm, which often emphasize linear progression and stability, the sustainable career framework acknowledges both the dynamic interplay between individual aspirations, organizational needs and broader socioeconomic trends (De Vos *et al.*, 2020; such as job market challenges in the career ecosystems; e.g. Nimmi and Petruzziello, 2023) and the imperative of balancing individual well-being with organizational goals and societal needs (e.g. Rochat and Masdonati, 2019). This holistic approach to careers aligns with the principles of sustainable development, which require a balanced focus on the economy, environment and social well-being (Behl and Sindhwani, 2024). Therefore, developing sustainable careers can be seen as a strategic means of advancing multiple United Nations sustainable development goals (SDGs).

Given that career sustainability is a dynamic and multifaceted concept requiring a solid conceptual framework, and considering the frequent discordance between theory, models and measurement tools (for a scoping review, see Russo *et al.*, under review), it is clear that advancing research in sustainable careers requires a psychometrically sound and multidimensional instrument (Van der Heijden *et al.*, 2020). Currently, the only available scale, developed by Chin *et al.* (2022), addresses dimensions from the model of Newman (2011) but does not include key aspects such as health, happiness, productivity (De Vos *et al.*, 2020) and social empowerment (Russo *et al.*, 2023a, under review). In response, we propose a theoretical refinement and a consequent new model for measuring career sustainability indicators that incorporates both individual and contextual elements. We also introduce a nomological network for sustainable careers, outlining the variables linked to it. Finally, this study undertakes the development of a new scale based on the sustainable career model proposed by Russo *et al.* (2023a), adapted from De Vos *et al.* (2020), intending to empirically validate the sustainable career paradigm through a five-step process and to enable researchers and practitioners to assess career sustainability across different time points, facilitating a thorough evaluation of its evolution over time.

Definitions and indicators of career sustainability

Sustainable careers can be defined as the:

> sequences of career experiences reflected through a variety of patterns of continuity over time, thereby crossing several social spaces, characterized by individual agency, herewith providing meaning to the individual (p. 7; Van der Heijden and De Vos, 2015).

The theoretical framework proposed by De Vos *et al.* (2020) sheds light on the characteristics of sustainable careers from a person-centered, systemic and dynamic perspective that simultaneously analyses three of the key dimensions at the core of career sustainability: people, contexts and time. In this concept of a sustainable career (De Vos *et al.*, 2020), the individual is seen as the central element, the one who acts actively, not only in managing his or her career but also in adapting to other stakeholders and contexts (private life, work context, job sector, broader labor market, society and culture; De Vos and Van der Heijden, 2017) and providing meaning to the career experiences. Therefore, this integrated perspective of factors includes both the individual level and a series of influences dictated by interaction with the context and must also be read in virtue of the eventualities that arise cyclically and continuously over time. According to Van der Heijden *et al.* (2020) and de Vos *et al.* (2020), sustainable careers can be described in terms of three basic groups of indicators: a) health (it includes both physical and mental health and the adaptation of health-related needs over time); b) productivity (it indicates the dynamic adaptation of the career to the needs of the organization's human capital both concerning current performance and regarding employability potential usable in the future or other jobs); and c) happiness (it indicates subjective aspects of the feeling of success or satisfaction with one's career over time).

These characteristics must be considered fundamental not only to the individual's well-being but also to the environment (family, colleagues, work organization to which he or she belongs, society as a whole) in which he or she is embedded and prospers (De Vos *et al.*, 2020).

Several authors have underlined that a conceptualization of career sustainability must also include and recognize the contributions to social empowerment of both individuals and broader societal and environmental contexts. For example, Rochat and Masdonati (2019) define sustainable careers as those integrating ethical considerations and addressing global needs. More anciently, Sultana (2014) discusses the role of career guidance in sustainable employment, emphasizing ethical responsibility and social justice advocacy. Other authors argue for prioritizing social justice in sustainable careers, for example, addressing inequalities in workplaces (McDonald and Hite, 2018) and implementing ethics-based guidance (Romero-Rodríguez *et al.*, 2022). Bal *et al.* (2020) propose redefining sustainable careers beyond a neoliberal perspective to incorporate ecological sustainability: sustainable careers can be understood in a collective dignity framework to respect and promote the intrinsic worth of both individuals and the planet itself. Recently, Guichard (2022) and Rochat (2024) have emphasized the importance of career guidance interventions that promote social justice and ecological sustainability by addressing environmental crises and raising clients' awareness of these challenges. Showing the practical intersection between sustainable careers and environmental sustainability, Zammitti *et al.* (2024) developed a sustainable career training program also aimed at encouraging a sense of community and proenvironmental behaviors such as increased use of public transportation.

Consistent with these argumentations, the recent qualitative study by Russo *et al.* (2023a) redefines and expands upon the concept of a sustainable career outlined by De Vos *et al.* (2020), conceptualizing it as an evolving sequence of work experiences characterized not

only by the subjective sense of success or satisfaction in one's career (happiness), physical and mental well-being (health) and the perception of achieving good performance and high career potential (productivity) but also by its contribution to improving societal conditions as a whole (social empowerment – introducing this new dimension). In this model, a sustainable career is one that collectively enhances the well-being and quality of life for individuals, others, society and the planet.

Variables related to career sustainability

The perspective just outlined offers numerous insights into the variables that might revolve around career sustainability. For these reasons, we describe here a theoretical nomological network that will then be tested in Studies 3 and 4 to clarify the relationships but not overlaps between career sustainability and other variables. For sustainable careers, for example, career competencies that enable individuals to move within their careers over time are useful (De Vos *et al.*, 2016); therefore, a positive relation may exist between career sustainability and an individual's perceived ability to obtain and maintain desirable employment known (i.e. *employability*; Le Blanc *et al.*, 2017; Van der Heijden *et al.*, 2020; Akkermans *et al.*, 2023). Furthermore, the emphasis on individuals' agency in managing sustainable careers underscores the significance of compatibility between the individual and the organization (De Vos *et al.*, 2016). This highlights the potential positive value of both conceptualizing one's *work as meaningful* (Steger *et al.*, 2012) and experiencing positive cognitive and emotional aspects at work, termed as *work engagement* (Schaufeli *et al.*, 2003), for cultivating a sustainable career (Magnano *et al.*, 2019; Hakanen *et al.*, 2021). Moreover, De Hauw and Greenhaus (2015) argue that a sustainable career fits into workers' broader life context, linking to *work–life balance*. The contemporary perspective on careers has to recognize the interdependencies between work and home (Greenhaus and Kossek, 2014) and sustainable careers have to connect with a whole-life perspective (Hirschi *et al.*, 2020). Moreover, especially in contexts of vulnerability, *decent work* – understood as productive work in which rights are protected and which generates adequate income with adequate social protection – can be seen as a building block for career sustainability (Urbanaviciute *et al.*, 2019).

Moreover, the intricate sequences of experiences constituting each career entail both positive and motivating episodes, as well as demotivating or unrewarding episodes that could potentially be associated with emotional and physical depletion resulting from workplace stress (Van der Heijden and De Vos, 2015). *Burnout* reduces perceived internal marketability and career satisfaction, hence, career sustainability (Barthauer *et al.*, 2020). Besides, what may appear to be a satisfying career at one point in time may not always be so in the long run (Van der Heijden and De Vos, 2015). This suggests that conceiving one's career in a sustainable and forward-looking manner may exhibit positive associations with *job satisfaction* (Asfahani *et al.*, 2023) and, from a broader perspective, have significant implications for overall well-being. Indeed, the sustainable career model emphasizes the spillover effects from work to life (Udayar *et al.*, 2021). Although indicators such as "health" and "happiness" within the framework of career sustainability inherently encapsulate dimensions of well-being specific to one's career, extending our understanding beyond the confines of career-related aspects is essential. As Chin *et al.* (2022) demonstrated, sustainable careers indeed positively influence psychological well-being. However, we aim to elucidate that the impact of a sustainable career extends beyond mere career-related well-being to encompass broader aspects of *eudaimonic, hedonic and social well-being*.

Overview of the study design

The sustainable career scale (SCS) based on the model of Russo *et al.* (2023a) adapted from De Vos *et al.* (2020) was developed through a five-step process, which encompassed five studies aiming to achieve the following objectives: item development and verification of the latent

structure of the SCS (Study 1); confirmation of the scale's factorial structure (Study 2); assessment of concurrent and discriminant validity by analyzing correlations with other work-related variables (Study 3); examination of predictive validity and reliability (Study 4); and measurement of gender invariance (Study 5). Data for each phase were collected at different time points, enabling a longitudinal exploration of the research topic.

Study 1: Development of scale items for sustainable career scale

The primary objective of Study 1 was to develop the SCS and establish its content validity (*H1*) while identifying its underlying factorial structure.

This endeavor began with a methodical delineation of the construct of "Career sustainability." This involved a comprehensive review of existing literature (Russo *et al.*, under review), consultation with previous studies, theoretical models and existing definitions within the realm of career sustainability. The sustainable career model we used to develop the scale is the one outlined by Russo *et al.* (2023a) which expands the model of the seminal work by De Vos *et al.* (2020). Russo *et al.*'s (2023a) model define a sustainable career as a sequence of career experiences characterized by happiness, health, productivity and social empowerment.

The subsequent phase of our research involved the generation of a comprehensive item pool, each item carefully crafted to reflect the different components of the career sustainability construct. In the first subphase, six experts in the domain of "Career Sustainability" were initially engaged to formulate items reflecting the following operationalization: a sustainable career is a sequence of work experiences characterized by the subjective sense of satisfaction and meaning in one's career (happiness), physical and mental well-being as a dynamic fit of the career with one's capacities and low level of stress (health), the perception of having good performance and high employability or career potential (productivity), contribution to improving societal conditions, well-being and quality of life through voluntary actions that positively impact others, society and the planet (social empowerment). This initial process resulted in the creation of an inventory comprising 163 items. In the second subphase, three experts conduct a critical and thorough review of the generated items. During this review, each item underwent an assessment of relevance, clarity and completeness. During this phase, for example, the experts decided to use the term "work" in some items to reflect the daily and immediate experiences of participants that contribute to career sustainability, as these cumulative everyday work experiences form the foundation of a sustainable career. This phase concluded with the refinement of the scale, resulting in a pilot version comprising 106 items, which was then administered for further evaluation through exploratory factor analysis (EFA).

To address the contextual dimension inherent in the conceptualization of sustainable careers, participants were instructed to consider their overall career experiences across various professional settings when responding to the questionnaire (for full instructions, please refer to Appendix).

The approach adopted by the authors to address the temporal dimension inherent in career sustainability while using a criterion of parsimony, involved developing items focusing on the "present" dimension, i.e. the "here and now," deferring to the longitudinal assessment of the dynamic evolution of one's perception of career sustainability over time.

Method

Participants and procedure

The participants in the study were 366 adults engaged in work, internship and voluntary work, aged between 19 and 65 years (M = 34.08; SD = 11.67). Sixty-four percent were women.

Participants were selected through convenience sampling methods from the general population, and recruitment efforts were conducted through various channels, including online platforms, professional networks and organizations.

To determine the minimum required sample size, we adhered to the rule of thumb established by Cattell (1978) and Bujang *et al.* (2012), which suggests that the ratio of individuals to variables should be 1:3. As a result, 366 individuals represent a larger sample size than the 318 required for assessing the 106 items we aimed to test.

The educational level of the participants was as follows: 0.5% primary studies, 7.4% mid-level study graduates, 31.7% college graduates, 11.5% bachelor graduates, 42.3% master graduates, 6.5% people with postgraduate specialization or PhD.

Concerning their working positions, 26.2% of participants were employees in a public company, 27% were employees in a private company, 14.2% were self-employed or freelance workers, 6.3% were entrepreneurs or managers of a company, 11.7% were trainees or interns, 1.4% were volunteers and 13.1% stated that they had another working position. Deepening, 88.5% of participants declared that they held only one job, while 11.5% declared that they held two jobs.

For employees (both in the public and private sectors), 16.1% stated that they had a permanent contract, 20.2% that they had a fixed-term contract and 16.9% stated that they had another type of contract (e.g. project-based contract, coordinated and continuous collaboration contract, intermittent work contract and on-call work contract).

Participants were informed about the study's purpose and procedures and were asked to provide their informed consent before proceeding with the data collection process, in complete anonymity, under EU GDPR 679 / 2016 on the protection of personal data. Participants contributed voluntarily and without financial compensation. The study was conducted between October 2022 and March 2023. The duration of data-gathering efforts ranges from 10 min to 15 min for participants to complete the survey.

Data analysis

In the preliminary phase of the data analysis, descriptive statistics were computed.

Our initial steps in the data analysis process involved conducting two crucial tests: the Kaiser–Meyer–Olkin (KMO) test and Bartlett's sphericity test ($\chi 2$), to determine the suitability of the data for EFA (Polit and Beck, 2020; Tabachnick and Fidell, 2019). The KMO test is used to assess the overall sampling adequacy for factor analysis. Specifically, we sought a KMO value greater than 0.7, indicating that the data are sufficiently suitable for factor analysis. Simultaneously, we performed Bartlett's sphericity test to assess the correlations between the variables. Significance in Bartlett's test ($\chi 2$) further affirms the appropriateness of the data for EFA.

We conducted EFA, using principal axis factoring with Promax rotation in IBM SPSS Statistics Version 25.0, to identify the underlying structure of the measurement scale. To determine the number of factors to extract from our data set, we considered two best practices in EFA (Polit and Beck, 2020; Tabachnick and Fidell, 2019): scree plot criterion and Kaiser's rule.

In each step of EFA, we carefully examined the factorial loadings of each item on each factor, and we removed items that were cross-loading (>0.40) or did not load substantially on any factor (<0.40; Hinkin, 1998). To obtain a simple measurement structure and improve the measurement efficiency, we retained the best three items of each factor, defined as those with the greatest factor loadings (at least 0.50), minimal cross-loadings (less than 0.30) and comprehensive content representation (Worthington and Whittaker, 2006), ensuring that each factor will be represented by three items with large loadings on it (McDonald, 1985).

The reliability of the measurements was evaluated using indices such as alpha (α) and omega (ω).

Results

The data were suitable for factor analysis because KMO test value was 0.78 and Bartlett's test was significant ($\chi 2 = 2{,}586.36$; $p < 0.001$).

The results of the exploratory factorial analysis show a four-factor solution, with the first eigenvalue of 4.20, the second of 2.36, the third of 1.85, the fourth of 1.24 (the fifth was 0.44), accounting for 71,22% of the variance.

Table 1 shows descriptive statistics, commonalities and factor loadings of the retained items of the scale.

In this study, Cronbach's alpha coefficient was calculated and found to be 0.88 for happiness, 0.86 for health, 0.89 for productivity, 0.88 for social empowerment and 0.82 for the total scale (Confidence Interval, C.I. 95%, bootstrap with 2.000 repetitions), indicating good internal consistency. Moreover, McDonald's Omega was 0.88 for happiness, 0.86 for health, 0.89 for productivity and 0.88 for social empowerment, for the overall scale was 0.80 (C.I. 95%, bootstrap with 2,000 repetitions), showing good reliability.

Study 2: Confirmatory factor analysis

Study 2 aimed to assess the suitability of the SCS factorial structure identified in Study 1 through confirmatory factor analysis (CFA). The hypothesis (*H2*) proposed a strong fit between a higher-order model and the observed data, thus confirming the scale's factorial structure.

Method

Participants and procedure

The participants in the study were 470 adults engaged in jobs or internships, aged between 19 and 63 years (M = 33.95; SD = 10.01). In total, 65.7% define themselves as female, 32.8% define themselves as male and 1.5% prefer not to define themselves.

The sample size for this study was calculated *a priori* using Soper's (2023) software for structural equation models. Assuming an acceptable alpha error of 0.05, aiming for 95% power, considering 5 latent variables and 12 observed variables, the minimum sample size was found to be 308, considering an effect size of 0.50.

Concerning their working positions, 23% of participants were employees in a public company, 26% were employees in a private company, 14.9% were self-employed or freelance workers, 5.1% were entrepreneurs or managers of a company, 16% were trainees or interns, 15.1% stated that they had another working position. Deepening, 88.3% of participants declared that they held only one job, while 11.7% declared that they held two jobs.

For employees (both in the public and private sectors), 14.7% stated that they had a permanent contract, 20.4% that they had a fixed-term contract and 8.9% stated that they had another type of contract (e.g. project-based contract, coordinated and continuous collaboration contract, intermittent work contract and on-call work contract).

Participants were recruited and informed through the same procedure of Study 1.

Measure

Sustainable career scale. The 12-item version of the scale, divided into the four factors of happiness, health, productivity and social empowerment, was used. The instructions were the same as those in Study 1 and involved responding on a scale ranging from 1 (it is never true for me) to 7 (it is always true for me). For the final version of the SCS scale, please see Appendix.

Table 1. Exploratory factor analysis results of sustainable career scale

Item	M (SD)	Skewness	Kurtosis	Commonalities	Factor 1 Happiness	Factor 2 Health	Factor 3 Productivity	Factor 4 Social empowerment
1. My career allows me to be satisfied with my life	5.01 (1.42)	−0.58	0.14	0.69	0.83			
9. I am satisfied with how my career has evolved	4.97 (1.63)	−0.68	−0.23	0.70	0.86			
12. The work I do makes me feel fulfilled as a person	5.10 (1.60)	−0.75	−0.13	0.75	0.84			
65. My job makes me so tired that I cannot concentrate*	5.15 (1.66)	−0.74	−0.34	0.63		0.77		
67. I often wake up during the night thinking about my work*	5.39 (1.79)	−0.86	−0.44	0.55		0.75		
68. I am afraid that the stress levels of my job will cause me some illness*	5.35 (1.84)	−0.93	−0.30	0.86		0.93		
75. I think I am competent in what I do in my job	5.67 (1.21)	−0.88	0.32	0.55			0.74	
78. I think I am prepared to do my job	5.63 (1.20)	−0.84	0.62	0.80			0.89	
79. I believe I am good at my job	5.73 (1.12)	−0.93	0.98	0.86			0.93	
104. Through my work, I can contribute to building a better society	5.28 (1.63)	−0.92	0.17	0.54				0.74
31. I feel that my work contributes to the improvement of the quality of life of society	4.95 (1.72)	−0.71	−0.30	0.86				0.92
32. My work makes an important contribution to the well-being of the community and/or people	5.18 (1.64)	−0.73	−0.27	0.75				0.85

Notes. *Reversed items
Source: Authors' own work

Data analysis

We conducted a CFA testing three models with CFA: Model 1, with a single factor model (sustainable career); Model 2, with four factors (happiness, health, productivity and social empowerment); Model 3, with four factors (happiness, health, productivity and social empowerment) organized under a higher-order factor of career sustainability. The rationale for this comparison is to explore whether career sustainability is best represented as a single factor, correlated factors, or as a higher-order construct, with the latter being the most plausible option based on the literature. To assess model fit, we used several indices. The CMIN/DF ratio indicated a better fit with lower values. The CFI and TLI values closer to 1 indicated a better fit, with a threshold of 0.90 or higher generally considered acceptable (Hu and Bentler, 1999). The RMSEA values below 0.08 were acceptable, with those below 0.05 indicating a good fit (Browne and Cudeck, 1993). The SRMR values below 0.10 were acceptable, with those below 0.05 indicating a good fit (Schermelleh-Engel *et al.*, 2003). To compare the three different models, we also evaluated AIC and BIC values, with lower values indicating a better fit to the data (Burnham and Anderson, 2004).

Results

Table 2 shows the descriptive statistics and factor loadings of the instrument. Model 1 (12 items; one-factor solution) yielded the following fit indices: CMIN/DF = 2,203.860/54, CFI = 0.388, TLI = 0.252, RMSEA = 0.291 (90% CI 0.281–0.301), SRMR = 0.196, AIC = 19,380.376, BIC = 19,480.042.

Model 2 (12 items; four factors: happiness, health, productivity and social empowerment) demonstrated the following fit to the data: CMIN/DF = 63.627/48, CFI = 0.996, TLI = 0.994, RMSEA = 0.026 (90% CI 0.000–0.042), SRMR = 0.026, AIC = 17,252.144, BIC = 17,376.725.

Model 3 (12 items; four factors: happiness, health, productivity and social empowerment; one higher-order factor: sustainable career) demonstrated the following fit to the data: CMIN/DF = 68.80/50, CFI = 0.995, TLI = 0.993, RMSEA = 0.028 (90% CI 0.006–0.044), SRMR = 0.032, AIC = 17,253.314, BIC = 17,369.590.

Table 2. Descriptive statistics and factor loadings of the SCS for confirmatory factor analyses (n = 470)

Item	M (SD)	Factor 1 Happiness	Factor 2 Health	Factor 3 Productivity	Factor 4 Social empowerment
1	4.82 (1.45)	0.84			
2 §	4.79 (1.62)	0.80			
3	4.95 (1.64)	0.86			
4 *§	5.00 (1.64)		0.80		
5 *	5.26 (1.79)		0.77		
6 *	5.33 (1.79)		0.90		
7 §	5.61 (1.23)			0.82	
8	5.57 (1.19)			0.91	
9	5.64 (1.16)			0.94	
10	5.19 (1.62)				0.94
11 §	4.87 (1.70)				0.88
12	5.10 (1.59)				0.72

Notes: *Reversed items; § Items included in the SCS brief version
Source: Authors' own work

Both AIC and BIC values were significantly lower for Models 2 and 3 compared to the one-factor Model 1, signifying superior fit and adaptability to the data. Upon comparing the fit indices of Models 2 and 3, given the marginal difference in chi-square as well as other indicators, and considering that Model 3 has a lower BIC than Model 2 and is more aligned with theory (Sellbom and Tellegen, 2019), the decision is made to select Model 3 with a higher-order factor (sustainable career) comprising four dimensions (health, happiness, productivity and social empowerment) as the most appropriate model.

To facilitate the use of the scale in settings where fewer items are preferred, we developed a shortened version of the SCS by selecting one item on each dimension. A CFA was performed, showing that the brief model (four items; one factor: SCS – brief version) demonstrated the following fit indices: CMIN/DF = 1.306 / 2, CFI = 1.000, RMSEA = 0.000 (90% CI 0.000–0.081), SRMR = 0.014, AIC = 6,794.004, BIC = 6,827.226. Factor loadings were as follows: Item 2 = 0.847; Item 4 = 0.198; Item 7 = 0.324; and Item 11 = 0.541.

Study 3: Concurrent and discriminant validity of the scale

Study 3 investigated the concurrent and discriminant validity of the SCS by comparing it to measures of work engagement, work meaning, burnout, work-family balance, employability, decent work and job satisfaction. We hypothesized positive correlations between SCS scores and measures of work engagement, work meaning, work–family balance, employability, job satisfaction and decent work (*H3a*) and a negative correlation with burnout (*H3b*). The mentioned variables are expected to be related to, but distinct from, career sustainability (for comprehensive justification, see the "Variables related to career sustainability" section in the introduction). Therefore, discriminant validity was explored by examining the extent to which SCS dimensions could be differentiated from each other (*H3c*) and the related constructs (external discriminant validity, *H3d*).

Method

Participants and procedure

The participants in the study were 310 adults engaged in jobs or internships, aged between 19 and 69 years (M = 42.72; SD = 12.13). In total, 41.0% define themselves as female, 57.1% define themselves as male and 1.9% prefer not to define themselves.

The minimum sample size for this study was determined *a priori* using the G*power software, specifically applying the test statistic "correlation: bivariate normal model." With an alpha error level set at 0.05 and a target power of 95%, assuming a correlation coefficient (ρ) under the alternative hypothesis (*H1*) of 0.20, the calculated minimum sample size was found to be 266.

Concerning their working positions, 22.9% of participants were employees in a public company, 63.9% were employees in a private company, 4.2% were self-employed or freelance workers, 2.3% were entrepreneurs or managers of a company, 1.9% were trainees or interns and 4.8% stated that they had another working position.

Concerning the type of contract, 75.2% stated that they had a permanent contract, 15.2% that they had a fixed-term contract, 1,9% are doing an apprenticeship, 1.0% stated that they had another type of contract, 6.8% that they have a job that does not require a contract.

Participants were recruited and informed through the same procedure described in the Studies 1 and 2.

Measures

Sustainable career scale. The same scale used in Study 2 was also used in Study 3. In this study, Cronbach's alpha coefficient was 0.89 for happiness, 0.78 for health, 0.89 for productivity, 0.89 for social empowerment and 0.81 for the total scale (C.I. 95%, bootstrap with 1,000 repetitions).

Work engagement: the Utrecht Work Engagement Scale (UWES-9; Schaufeli *et al.*, 2003; Italian version Balducci *et al.*, 2010) was used to assess the work's positive cognitive and emotional experiences, characterized by vigor, dedication and absorption. People are required to respond to nine questions on a seven-point Likert scale. Sample item: "At my work, I feel bursting with energy." Cronbach's alpha coefficient was 0.92.

Work meaning: the work and meaning inventory (WAMI) was used to assess the extent of meaning and significance individuals find in their work (Steger *et al.*, 2012; Italian version by Magnano *et al.*, 2022). Sample item: "I understand how my work contributes to my life's meaning." Responses are collected using a five-point Likert scale. The Cronbach's alpha coefficient was 0.91.

Employability: employability refers to an individual's perceived ability to obtain and maintain desirable employment. The self-perceived employability scale (Rothwell and Arnold, 2007; Italian version by Lodi *et al.*, 2020) is composed of 11 items on a five-point Likert-type scale which asses internal and external perceived employability. Sample item: "I could get any job, anywhere, so long as my skills and experience were reasonably relevant." The Cronbach's alpha coefficient was 0.84.

Work–family balance: work–family balance can be defined as a successful fulfillment of role-related expectations collaboratively negotiated and shared between an individual and their counterparts in both the professional and familial spheres (Grzywacz and Carlson, 2007). To assess this construct, we used the scale by Carlson *et al.* (2009; Italian version by Landolfi and Lo Presti, 2022), which comprised six items with a five-point Likert scale. Sample item: "I am able to negotiate and accomplish what is expected of me at work and in my family." The Cronbach's alpha coefficient was 0.91.

Job satisfaction: a shorter five-item version of the job satisfaction scale (Judge *et al.*, 1998; Italian validation by Di Fabio, 2018) of the original 18-item version of the job satisfaction scale (Brayfield and Rothe, 1951) was used to measure individuals' subjective satisfaction with their job. Responses are collected using a six-point Likert scale. Sample item: "I feel pretty satisfied with my current job." Cronbach's alpha coefficient was 0.80.

Burnout: the burnout assessment tool (BAT; Schaufeli *et al.*, 2020) will be used to measure burnout in its shorter 12-item version (Hadžibajramović *et al.*, 2022; Italian validation by Mazzetti *et al.*, 2022). According to BAT, burnout is characterized by emotional and physical depletion resulting from workplace stress. Responses are collected on a five-point Likert scale. Sample item: "I feel mentally exhausted." Cronbach's alpha coefficient was 0.90.

Decent work: the decent work scale (DWS; Duffy *et al.*, 2017; Italian validation by Di Fabio and Kenny, 2019) is designed to assess the perception of having decent work using 15 items with responses on a seven-point Likert scale. Sample item: "I feel physically safe interacting with people at work." Cronbach's alpha coefficient was 0.83.

Data analysis

SPSS version 25.0 was used to test concurrent validity, which was assessed by correlating the scores of the SCS, using Pearson's r coefficient, with widely-known measures of work engagement, work meaning, burnout, work–family balance, employability, decent work and job satisfaction.

Rstudio was used to assess the discriminant validity. First, we run CFA to calculate factor loading for all the measures; then, we calculate average variance extracted (AVE) to measure

how much a latent construct clarifies variance in its related observed variables, with a recommended threshold of at least 0.50 (Hair *et al.*, 2010). High and significant correlations between different scales highlight the potential issue of multicollinearity (Fornell and Larcker, 1981). Discriminant validity tests a latent variable's ability to differentiate from other variables within the same framework, and it holds when the unique variance captured by each construct (indicated by AVE) is higher than the shared variance between the constructs (indicated by the squared factor correlation; Fornell and Larcker, 1981).

Results

Table 3 presents the correlations between the SCS and all variables included in the study. Moderate to medium correlations were observed among most dimensions.

Additionally, the social empowerment dimension showed a significant positive correlation with the happiness dimension. However, the health dimension of the SCS did not correlate with neither the productivity and social empowerment dimensions of the SCS nor with employability. Moreover, a strong and positive correlation was identified between burnout and SCS health and SCS total. Furthermore, a significant positive correlation emerged between SCS total and decent work.

Discriminant validity for SCS was assessed by calculating the AVE and comparing it with the squared correlation between the constructs (R^2).

As can be seen in Table 4, the analysis revealed that the AVE for happiness (AVE = 0.73), health (AVE = 0.57), productivity (AVE = 0.74) and social empowerment (AVE = 0.74) exceeded the recommended threshold of 0.50. Additionally, the squared correlation between the constructs (R^2) was lower than the AVE for all the dimensions, suggesting that multicollinearity in the SCS scale was not a concern.

Furthermore, AVE values for happiness, health, productivity, social empowerment and the total score of SCS were higher than the squared correlation between SCS and all the studied variables, confirming external discriminant validity (see Table 4).

Study 4: Predictive validity and test-retest reliability

Study 4 used a longitudinal two-wave design with a seven-week interval to assess the predictive validity and reliability of the SCS. The study hypothesized that higher SCS scores would predict increased levels of eudaimonic, hedonic and social well-being (*H4a*, *H4b* and *H4c*), thus demonstrating the scale's predictive validity beyond career-specific well-being. The impact of a sustainable career may extend beyond career-specific well-being, which is already inherent in its conceptualization, to include broader aspects of eudaimonic, hedonic and social well-being. These relationships warrant a thorough examination (for a comprehensive justification, see the "Variables related to career sustainability" section).

Additionally, test-retest reliability was examined to assess the scale's stability over a short period, a crucial step considering the dynamic nature of sustainable careers. As career experiences evolve in response to significant events and choices, with some consequences potentially emerging only in the long term (De Vos *et al.*, 2020), measuring the scale's reliability over a short interval helps establish its consistency in capturing these evolving trajectories.

Method

Participants and procedure

The participants in the study were 50 adults engaged in jobs or internships, aged between 25 and 58 years (M = 38.72; SD = 8.64). In total, 74% define themselves as female, 24% define themselves as male and 2% define themselves as nonbinary.

Table 3. Pearson's correlation

Variable	1	2	3	4	5	6	7	8	9	10	11
1. SCS happiness	–										
2. SCS health	0.24**	–									
3. SCS productivity	0.20**	0.02	–								
4. SCS social empowerment	0.53**	0.02	0.30**	–							
5. SCS total	0.79**	0.55**	0.49**	0.73**	–						
6. UWES	0.68**	0.23**	0.40**	0.61**	0.74**	–					
7. WAMI	0.67**	0.15**	0.28**	0.74**	0.73**	0.77**	–				
8. EMP	0.28**	−0.03	0.41**	0.43**	0.40**	0.45**	0.45**	–			
9. BAT	−0.32**	−0.60**	−0.24**	−0.25**	−0.56*	−0.46**	−0.39**	−0.20**	–		
10. DWS	0.44**	0.45**	0.19**	0.34**	0.60**	0.60**	0.45**	0.26**	−0.45**	–	
11. WFB	0.21**	0.29**	0.39**	0.25**	0.42**	0.42**	0.32**	0.37**	−0.41**	0.42**	–
12. JSS	0.64**	0.39**	0.20**	0.46**	0.68**	0.68*	0.66**	0.28**	−0.61**	0.51**	0.31**

Notes: * $p < 0.05$. ** $p < 0.01$ SCS = sustainable career scale; UWES = work engagement; WAMI = work meaning; EMP = employability; DWS = decent work; WFB = work – family balance; JSS = job satisfaction; BAT = burnout
Source: Authors' own work

Table 4. Average variance extracted scores and squared correlations for different measures

Variable	AVE	R^2 1	2	3	4	5	6	7	8	9	10	11
1. SCS happiness	0.73	–										
2. SCS health	0.57	0.05	–									
3. SCS productivity	0.74	0.04	0.01	–								
4. SCS social empowerment	0.74	0.28	0.01	0.09	–							
5. SCS total	0.69	0.62	0.30	0.24	0.53	–						
6. UWES	0.69	0.46	0.05	0.16	0.37	0.55	–					
7. WAMI	0.55	0.45	0.02	0.08	0.55	0.53	0.59	–				
8. EMP	0.51	0.07	0.01	0.17	0.18	0.16	0.20	0.20	–			
9. BAT	0.62	0.10	0.36	0.06	0.06	0.31	0.21	0.15	0.04	–		
10. DWS	0.70	0.19	0.20	0.03	0.11	0.36	0.36	0.20	0.07	0.20	–	
11. WFB	0.64	0.04	0.08	0.15	0.06	0.18	0.18	0.10	0.14	0.17	0.18	–
12. JSS	0.52	0.41	0.15	0.04	0.21	0.46	0.46	0.43	0.08	0.37	0.26	0.10

Notes: AVE = average variance extracted; R^2 = squared correlations; SCS = sustainable career scale; UWES = work engagement; WAMI = work meaning; EMP = employability; DWS = decent work; WFB = work – family balance; JSS = job satisfaction; BAT = burnout
Source: Authors' own work

The sample size for this study was calculated *a priori* using G*power software, using *t*-test, correlation point biserial model. Assuming an acceptable alpha error of 0.05 and aiming for 95% power, the minimum sample size was found to be 42, considering an effect size of 0.50.

Concerning their working positions, 36% of participants were employees in a public company, 14% were employees in a private company, 16% were self-employed or freelance workers, 12% were trainees or interns and 22% stated that they had another working position.

Measures

Sustainable career scale. The same scale used in Study 2 was also used in Study 3. In the two waves of this study, Cronbach's alpha coefficient was, respectively, 0.85 and 0.94 for happiness, 0.82 and 0.70 for health, 0.73 and 0.87 for productivity, 0.89 and 0.91 for social empowerment, 0.74 and 0.87 for the total scale (C.I. 95%, bootstrap with 1,000 repetitions).

Well-being. The mental health continuum (MHC-SF; Keyes *et al.*, 2008; Petrillo *et al.*, 2015) was used to evaluate three dimensions of well-being with its 14 items: emotional well-being, characterized by positive emotions and life satisfaction (hedonic; sample item: "[…] satisfied with life"); psychological well-being, encompassing positive relationships, feelings of competence and a sense of meaning and purpose in life (eudaimonic; sample item: "[…] that your life has a sense of direction or meaning to it"); and social well-being, which examines individuals' functioning in the social domain, including aspects of social integration and contribution (sample item: "[…] that our society is a good place, or is becoming a better place, for all people"). Respondents rated their experiences on a six-point Likert scale. In the two waves of this study, Cronbach's alpha coefficient was, respectively, 0.80 and 0.76 for emotional WB, 0.81 and 0.87 for psychological WB, 0.84 and 0.93 for social WB and 0.92 and 0.90 for the total scale (C.I. 95%, bootstrap with 1,000 repetitions).

Data analysis

These statistical procedures of this study were performed using SPSS 25.0. In the data analysis, we conducted regression analyses to assess predictive validity, aiming to understand how well career sustainability assessed at T1 could predict the overall well-being, as measured at T2 by the MHC (Keyes *et al.*, 2008), controlling for the potential confounding factors of age, gender and working positions. Additionally, we ensured the test-retest reliability by calculating intraclass correlation coefficients after a seven-week interval.

Results

The regression analysis results indicate a significant relationship between the sustainability of a career and the total score of well-being as well as the three dimensions of well-being: emotional, psychological and social (Table 5). For total well-being, the regression analysis revealed a positive β coefficient of 0.49 (t = 3.38, p = 0.002), suggesting that a sustainable career is associated with higher scores on well-being. The model accounted for 21% of the variance in total well-being (R^2 = 0.21), and the overall model fit was significant (F = 11.41). These findings support the hypothesis that a sustainable career positively influences well-being, underscoring the importance of fostering sustainable career paths to promote it.

Regarding test-retest reliability, the intraclass correlation coefficient for Happiness was 0.73 (95% CI [0.52, 0.84]), for health was 0.54 (95% CI [0.18, 0.74]), for productivity was 0.61 (95% CI [0.32, 0.78]) and for social empowerment was 0.79 (95% CI [0.63, 0.88]. For the total score, the intraclass correlation coefficient was 0.78 (95% CI [0.60, 0.87]).

Study 5: Measurement invariance

Study 5 aimed to test gender invariance (*H5*). While both men and women generally experience similar changes in performance, health and well-being, women can encounter unique challenges (Schalk *et al.*, 2015). Specifically, women demonstrate a weaker relationship between career opportunities and both work–life balance and perceived health compared to men. Additionally, the impact of work–life balance on well-being is more pronounced for women (Pace and Sciotto, 2022). These differences may be attributed to hormonal fluctuations experienced by women, such as those during menopause, which affect their health (Goldman, 2010). Moreover, societal expectations may place additional caregiving responsibilities on women for children and elderly relatives, leading to work–family conflicts rooted in cultural stereotypes (Riley and Bowen, 2005). These challenges impact women's well-being in the workplace and consequently affect their retention and performance throughout their careers (Schalk *et al.*, 2015).

Table 5. Results of the predictive validity of SCS on well-being

Dependent variable	β	t	p	Model statistics
Emotional well-being	0.42	2.89	0.006	R^2 = 0.21 F = 8.36
Psychological well-being	0.39	2.57	0.014	R^2 = 0.13 F = 6.61
Social well-being	0.43	2.88	0.006	R^2 = 0.19 F = 8.31
Total well-being	0.49	3.38	0.002	R^2 = 0.21 F = 11.41

Note: SCS = sustainable career scale
Source: Authors' own work

To validate the SCS across genders, we used measurement invariance analysis, comparing models between groups at configural (*H5a*), metric (*H5b*), scalar (*H5c*) and residual (*H5d*) levels.

Method

Participants and procedure

The participants in the study were 413 adult workers (55.4% female and 44.6% male) aged between 19 and 67 years (M = 36.65; SD = 11.13).

The sample size for this study was calculated *a priori* using Soper's (2023) software. Assuming an acceptable alpha error of 0.05, aiming for 95% power, considering 5 latent variables and 12 observed variables, the minimum sample size was found to be 308, considering an effect size of 0.50.

Concerning their working positions, 21.1% of participants were employees in a public company, 40.2% were employees in a private company, 10.7% were self-employed or freelance workers, 4.8% were entrepreneurs or managers of a company, 11.1% were interns, 12.1% stated that they had another working position.

Participants were recruited and informed through the same procedure described in Studies 1, 2 and 3.

Data analysis

We assessed gender invariance using IBM SPSS Amos, version 25.0, through multiple-group CFAs to test configural, metric (weak), scalar (strong) and residual (strict). Model fit was evaluated using the same indices as in Study 1. Invariance was tested by comparing nested models and estimating differences in fit indices, with RMSEA differences of ≥0.015 and CFI differences of ≥0.010, indicating a lack of invariance (Chen, 2007).

Results

The first multiple-group analysis tested a model of configural invariance (Model 1) by simultaneously evaluating the fit of the model on male and female samples. The fit indices ($\chi^2_{(110)}$ = 194.02, p = 0.00; CFI = 0.97; SRMR = 0.07; RMSEA = 0.04) all indicated an acceptable fit for this model, supporting an equivalent four-factor solution with an higher-order factor for the SCS for both men and women.

Model 2 tested for metric or weak invariance. All the fit indices were acceptable (Table 6). Moreover, $\Delta\chi^2_{M2\text{-}M1}$ = 6.13 and ΔCFI = 0.002 suggested that Model 2 was equivalent to Model 1. Thus, metric invariance was supported.

Model 3 tested for scalar or strong invariance, finding an acceptable fit ($\Delta\chi^2_{M3–M2}$ = 4.92, ΔCFI = 0.000).

Finally, we tested the equivalence in measurement errors or residual invariance (Model 4): $\Delta\chi^2_{M4–M3}$ = 29.67, ΔCFI = 0.006. Results were satisfactory as the model fit proved to be invariant across both groups (see Table 6).

Discussion

Our study aimed to refine and develop the theory of sustainable careers by creating and validating the SCS through a five-step process. The main contribution of this paper is the empirical validation of the integration of the new dimension "social empowerment," which incorporates the perceived social utility of one's career as sustainable – an essential element in today's context.

The initial step (Study 1) focused on developing items for the SCS and verifying its latent structure. The results of this study align with *H1*, indicating that the items exhibit content validity

Table 6. Measurement invariance across genders for the SCS model

Model	χ^2/df	Model fit RMSEA (90% C.I.)	CFI	TLI	SRMR	Model comparison $\Delta\chi^2$	ΔRMSEA	ΔCFI
M1: configural invariance	194.02/110 ***	0.043 (0.03, 0.05)	0.973	0.967	0.072		–	–
M2: metric invariance	200.15/111 ***	0.044 (0.03, 0.05)	0.971	0.966	0.070	6.13	0.001	0.002
M3: scalar invariance	205.07/115 ***	0.044 (0.03, 0.05)	0.971	0.967	0.071	4.92	0.000	0.000
M4: residual invariance	234.74/127 ***	0.045 (0.04, 0.05)	0.965	0.964	0.072	29.67	0.001	0.006

Notes: SCS = sustainable career scale; ***$p < 0.001$
Source: Authors' own work

by encompassing the multidimensional facets of sustainable careers. This finding is notably significant as it marks the first instance in scientific literature, to the author's knowledge, wherein career sustainability is operationalized as a construct that integrates individual dimensions (happiness, health and productivity) with the broader social dimension (social empowerment).

In Study 2, we used a combination of CFA to assess and validate the proposed factorial structure of the SCS, as delineated by Russo *et al.* (2023a) and guided by our hypotheses, particularly *H2a*. Both Model 2, with four interrelated factors (happiness, health, productivity and social empowerment) and Model 3 (four factors with one higher-order factor: sustainable career) had excellent and similar fit indices. Using the model that best fits the theory as the criterion of choice (Sellbom and Tellegen, 2019), we conclude that Model 3 stands out as the best-fitting model for the SCS in our study.

Study 3 focused on assessing concurrent and discriminant validity through correlations with other work-related variables. The results substantiate *H3a–H3d*, indicating positive correlations with work engagement, work meaning, burnout, work–family balance, employability, decent work and job satisfaction; at the same time, career sustainability reported negative correlations with burnout. These findings are consistent with authors suggesting that happiness, a fundamental aspect of career sustainability, involves the dynamic alignment of the career with one's values, career goals and needs for personal growth (Sheldon *et al.*, 2002); therefore, career sustainability also pertains to subjective career success or career satisfaction (Seibert *et al.*, 2024). Moreover, the evidence that a sustainable career is negatively correlated with burnout reinforces findings by Khamisa *et al.* (2015), indicating that an increase in job demands or work-related issues can render individuals incapable of managing stressful work and lead to the development of burnout, thereby compromising their health. Furthermore, our findings highlight that productivity, a central element of career sustainability, is closely related to subjective ratings of career success, which are linked to the meanings that people attach to career experiences (De Vos *et al.*, 2016), work–family-balance (Gopalan and Pattusamy, 2020), as well as to their perceptions of employability (Lo Presti and De Rosa, 2023), a central element in building sustainable career futures and quality of life (Magnano *et al.*, 2019).

Discriminant validity analyses confirmed that the SCS scale does not have multicollinearity problems among its internal dimensions and that the construct of a sustainable career is different, although interrelated, to the constructs of work engagement, work meaning, burnout, work–family balance, employability, decent work and job satisfaction. This study also highlights the complex nature of a sustainable career, revealing that the health dimension neither does not

significantly correlate with productivity or social empowerment: it is not a given that good mental and physical health at work will automatically relate to feelings of productivity nor does it guarantee a perceived impact on the world. Moreover, sustainable careers and decent work appear to be related but distinct constructs; these findings thus call for a deeper exploration of their intricate relationship, which has been theoretically hypothesized to be influenced by factors such as social utility, automation and individual responsibility (Toscanelli *et al.*, 2019).

In Study 4, we demonstrated the predictive validity and reliability of the SCS over a severe-time interval. The results, in line with *H4d*, show that the total score of SCS demonstrates high test-retest reliability in a short time. However, the health dimension exhibited lower stability compared to happiness, productivity and social empowerment, likely due to its inherent variability influenced by moment-to-moment experiences and factors like perceived stress levels. This aligns with prior research highlighting the influence of subjective and fluctuating factors on sustainable careers (De Vos *et al.*, 2020). Thus, understanding the impact of intrapersonal and interpersonal events on career sustainability requires a sensemaking process exceeding a few weeks, as individuals need time to reflect, reframe and adapt (Schweitzer *et al.*, 2023). Moreover, in line with *H4a–H4c*, career sustainability holds predictive value for hedonic, eudaimonic and social well-being; consequently, career sustainability could significantly influence overall well-being. The career path is capable of influencing not only professional well-being but also personal well-being (Russo *et al.*, 2023b), with career sustainability having spillover effects from work to life (Udayar *et al.*, 2021). This finding aligns with Lawrence *et al.* (2015), suggesting that the concept of sustainable careers encompasses more than ecological dimensions, being linked to processes that enhance present and future quality of life. Career sustainability, therefore, could be considered a complex psychological dimension to be enhanced within career counseling pathways geared toward the promotion of human well-being and sustainability in today's risk society (e.g. Zammitti *et al.*, 2023).

The final study (Study 5) focused on measurement invariance, evaluating the consistency of the SCS across genders. Results in support of *H5a–H5d* provide evidence for gender invariance at configural, metric, scalar and residual levels, confirming that the structure of the scale, the relationship between scale items and the extent of the construct measured by the scale are essentially equivalent between males and females. Therefore, the SCS scale measures career sustainability fairly and accurately regardless of gender.

Conclusions, limitations and implications

Our study establishes the robust psychometric properties of the SCS, positioning it as a valuable instrument for assessing sustainable careers among workers. The collective findings across all studies significantly contribute to the expanding literature on sustainable career development, providing researchers and practitioners with a reliable tool to explore the multidimensional concept of sustainable careers, integrating a globally responsible perspective, encompassing both individual and societal needs within the framework of career sustainability.

However, this study has several limitations. The SCS is designed for workers, limiting its applicability to nonworking individuals. Additionally, as a measure of current career sustainability perception, it does not assess its evolution over time. The study also acknowledges the relationship between career sustainability and related variables without exploring their directional association, thereby inviting further research to investigate the antecedents and consequences of this relationship. Finally, the convenience sampling did not allow for homogeneous stratification based on work status and age. Given the impact of aging (Stuer *et al.*, 2019) and working conditions on career sustainability (Russo *et al.*, under review), future research should consider testing for scale invariance across different generations and various types of employment, such as dependent/independent workers or gig workers.

Future research should adapt or develop new instruments for assessing career sustainability in other groups, such as students or unemployed individuals. Over and above that, longitudinal studies could examine the evolution of career sustainability over time, using a mixed-methods approach to understand the individual, social and contextual factors influencing its maintenance or decline. In addition, in concert with the critical review of Seibert *et al.* (2024), researchers could explore how the perception of living a sustainable career is linked to more objective indicators of career success. Furthermore, it would be insightful to understand how various factors influence the relationship between the dimensions of the sustainable career construct. For instance, the link between mental/physical health and social empowerment may be mediated/moderated by work meaningfulness, while work engagement could mediate/moderate the relationship between mental/physical health and productivity.

Last but not least, as a practical implication, considering that sustainable Human Resource Management (HRM) can influence organizations to become more competitive and effective in their efforts to ensure economic prosperity, social well-being and ecological outcomes (Anlesinya and Susomrith, 2020), institutions and organizations could use this scale to longitudinally evaluate the sustainability of workers' careers. This assessment would determine whether individuals' careers are promoting sustainable development both in terms of personal well-being and social empowerment, thereby addressing global needs and fostering responsible management practices and sustainable career development. Some authors have developed tools to help individuals align their career choices with global needs (Rochat and Masdonati, 2019), highlighted the influence of SDGs on career pathways (Santilli *et al.*, 2023) and explored ways to promote sustainable careers alongside environmentally and socially sustainable behaviors (Zammitti *et al.*, 2024), serving as key examples in this field.

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Appendix. Sustainable career scale (SCS)

(Russo *et al.*, 2025)

This questionnaire evaluates how individuals live their careers, which represents the set of work experiences that unfold over a lifetime in diverse professional environments. We ask you to read carefully the following statements and indicate the extent to which each one aligns with your personal experiences. If you have multiple job contexts concurrently, please respond by considering an average assessment of how you feel regarding all your career activities. Use a scale of 1–7 to express the veracity of each statement:

1 = it is never true for me.
2 = it is rarely true for me.
3 = it is only occasionally true for me.
4 = it is true a few times for me.
5 = it is often true for me.
6 = it is true almost always for me.
7 = it is always true for me.

Keep in mind that there are no right or wrong answers. Your answers should reflect your personal experience.

[*Questo questionario valuta il modo di vivere la propria carriera, che rappresenta l'insieme di esperienze lavorative che si verificano nel corso della vita in vari contesti professionali. Ti chiediamo di leggere attentamente le seguenti affermazioni e di indicare quanto ognuna di esse rispecchi la tua esperienza personale. Se svolgi più lavori contemporaneamente, rispondi considerando una valutazione media di come ti senti rispetto a tutte le tue attività lavorative. Usa una scala da 1 a 7 per esprimere il grado di verità di ciascuna affermazione:*

1 = Non è mai vero per me
2 = È raramente vero per me
3 = È vero solo occasionalmente per me
4 = È vero alcune volte per me
5 = È spesso vero per me
6 = È vero quasi sempre per me
7 = È sempre vero per me

Ricorda che non esistono risposte giuste o sbagliate. L'importante è che le tue risposte riflettano la tua personale esperienza.]

1	My career allows me to be satisfied with my life [La mia carriera mi consente di essere soddisfatto/a della mia vita]	1	2	3	4	5	6	7
2§	I am satisfied with how my career has evolved [Sono soddisfatto di come si è evoluta la mia carriera]	1	2	3	4	5	6	7
3	The work I do makes me feel fulfilled as a person [Il lavoro che faccio mi fa sentire realizzato come persona]	1	2	3	4	5	6	7
4§	My job makes me so tired that I can't concentrate [Il mio lavoro mi stanca talmente tanto da non riuscire a concentrarmi]*	1	2	3	4	5	6	7
5	I often wake up during the night thinking about my work [Mi sveglio spesso durante la notte pensando al mio lavoro]*	1	2	3	4	5	6	7
6	I am afraid that the stress levels of my job will cause me some illness [Ho paura che i livelli di stress del mio lavoro mi provocheranno qualche malattia]*	1	2	3	4	5	6	7
7§	I think I am competent in what I do in my job [Penso di essere competente in ciò di cui mi occupo nel mio lavoro]	1	2	3	4	5	6	7
8	I think I am prepared to do my job [Credo di essere preparato per svolgere il mio lavoro]	1	2	3	4	5	6	7
9	I believe I am good at my job [Credo di essere bravo/a nel mio lavoro]	1	2	3	4	5	6	7
10	Through my work I can contribute to building a better society [Con il mio lavoro posso contribuire a costruire una società migliore]	1	2	3	4	5	6	7
11§	I feel that my work contributes to the improvement of the quality of life of society [Sento che il mio lavoro contribuisce al miglioramento della qualità della vita della società]	1	2	3	4	5	6	7
12	My work makes an important contribution to the well-being of the community and/or people [Il mio lavoro dà un contributo importante al benessere della comunità e/o delle persone]	1	2	3	4	5	6	7

Notes: *Items with reversed score. § items included in the SCS Brief version
Source: Authors' own work

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