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Article

Possessing 21st-Century Skills and Building Sustainable Careers: Early-Career Social Sciences Graduates' Perspectives

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Abstract: In today's complex labor market, social sciences graduates encounter various challenges and negative experiences in their current jobs and job transitions, which may threaten the sustainability of their careers. Possessing 21st-century skills is considered important in supporting their career sustainability. Employing a cross-sectional survey design, this study investigated which 21st-century skills help social sciences graduates build a sustainable career after their graduation. The sample consisted of 129 early-career social sciences graduates. We utilized both a variable-centered (path analysis) and a person-centered (latent profile) approach to data analysis. The path-analysis results showed that collaboration, creativity, and problem solving, but not communication and critical thinking, related to career sustainability. The results also revealed a suppressor effect of problem solving on the positive relationships between creativity and health-related problems, suggesting that problem solving may prevent creative individuals from developing health-related issues. Furthermore, latent-profile analysis demonstrated two profiles: sustainable and non-sustainable careers. While both profiles exhibited similar productivity levels, individuals from the non-sustainable profile reported lower happiness and higher health problems. Partly corroborating the path-analysis results, graduates with sustainable careers differed in communication and collaboration skills. This study enhances the understanding of 21st-century skills' role in career sustainability and validates the model of sustainable careers.

Keywords: 21st-century skills; higher education; social sciences graduates; sustainable careers



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1. Introduction

Over recent decades, careers have evolved in a dynamic, unforeseeable, and insecure work environment [1,2]. The use of outsourcing and part-time or temporary labor contracts has been expanded [3]. In advanced economies, organizations expect employees to be more proactive and entrepreneurial than in the past to be able to manage innovations and generate competitive advantage [4,5]. These changes and demands occurring in the labor market have affected the way individuals develop their careers [3,6]. Current careers are not stable or linear but rather flexible and shaped by multiple transitions [2,6,7]. Consequently, the working conditions and career patterns in today's labor market pose important difficulties in developing and maintaining a sustainable career [8]. A sustainable career is a continuing career-development process over time that is affected by personal and contextual factors and is indicated by high levels of health, happiness, and productivity [9].

Building a sustainable career is particularly challenging for social sciences graduates. Social sciences graduates are typically educated with a broad curriculum involving a strong theoretical focus, rather than a vocation-oriented education [10,11]. The career paths of social sciences graduates are less clear compared to graduates from applied fields such as medicine or engineering [12,13], and they are employed in various positions across different sectors [14,15]. Also, social sciences graduates experience challenging career transitions from higher education into the labor market after their graduation [12]. Research has

revealed that many social sciences graduates work long hours, have heavy workloads, experience stress, face burnout, and are likely to encounter a mismatch between their abilities and job requirements [13,16–19]. In line with that, there is empirical evidence showing that social sciences graduates are more often dissatisfied with their jobs or careers in general compared to graduates from applied fields (e.g., [20,21]). All these negative aspects and experiences can deteriorate their well-being [22] and performance at work [23], thereby threatening the sustainability of their careers [9].

In such a complex workplace, 21st-century skills gain importance in supporting career sustainability [1,24,25]. Clearly, an expanding body of literature has emphasized the value of skills in building sustainable careers (e.g., [26,27]). While not explicitly approaching career sustainability from a theoretical standpoint, previous research provides evidence supporting the link between possessing skills and building sustainable careers. The OECD Survey of Adult Skills [28], for example, showed that workers who used information-processing skills were more likely to earn higher wages and to be satisfied at work. De Guzman and Choi [29] demonstrated that perceived communication, collaboration, and problem-solving skills were positively related to the career adaptability of technical school graduates. Similarly, Habets et al. [30] found that students' self-reported 21st-century skills positively related to how they perceived the fit between their curriculum and their future labor-market position. Moreover, with a specific focus on social sciences graduates, a recent systematic review uncovered that both social sciences graduates and employers reported communication and problem-solving skills most frequently as crucial for sustainable careers [31]. However, there remains a gap in understanding how specific 21st-century skills help social sciences graduates develop a sustainable career after their graduation. In this study, we aim to fill in this gap by answering this research question: "1. What is the relationship between possessing 21st-century skills and building a sustainable career for early-career social sciences graduates?"

Using a variable-centered approach, we will investigate the relationships between specific skills and sustainable career outcomes as independent entities, unveiling the underlying mechanisms that drive sustainable career development within the social-sciences domain. In addition, acknowledging the diversity within university graduates and recognizing the heterogeneity among individuals, this study delves into the unique career patterns that possible subgroups within the social sciences may possess. Therefore, in this study, we also aim to answer the following research question: "2. What latent subgroups of career sustainability exist within social sciences graduates, and how do these subgroups differ in possessing 21st-century skills?"

Overall, using both a variable-centered and person-centered approach, we aim to shed light on not only the overarching relationships between possessing 21st-century skills and career sustainability, but also the nuanced variations that make sustainable careers a personalized journey for individuals within the diverse group of social sciences graduates. We investigate career sustainability as a multidimensional construct captured by three interrelated indicators, namely happiness, health, and productivity [9]. As a result, our study makes important contributions to the model of sustainable careers and to the scholarly field of 21st-century skills training in terms of comprehensively portraying the multifaceted nature of social sciences graduates' career sustainability through crucial 21st-century skills.

2. Theoretical Framework

2.1. Career Sustainability of Social Sciences Graduates

The concept of sustainable careers can be defined as an individual's career journey, which encompasses a range of experiences over time, crosses various social settings, and is influenced by personal decisions and actions, thereby providing meaning to the individual [32]. Sustainable career development is affected by several personal and contextual factors [9,32]. Personal factors refer to motivations, beliefs, and skills that play a key role in managing a sustainable career [9]. Contextual factors refer to the contexts in which an individ-

ual's career takes place, including private life (e.g., family and peers), work-related factors (e.g., supervisors), and organizational policies that influence an individual's career decisions, career management, and eventually career sustainability [9]. In this research, we focus on 21st-century skills as the personal factors affecting social sciences graduates' potential to build a sustainable career. The theoretical model underlying this study is presented in Figure 1.

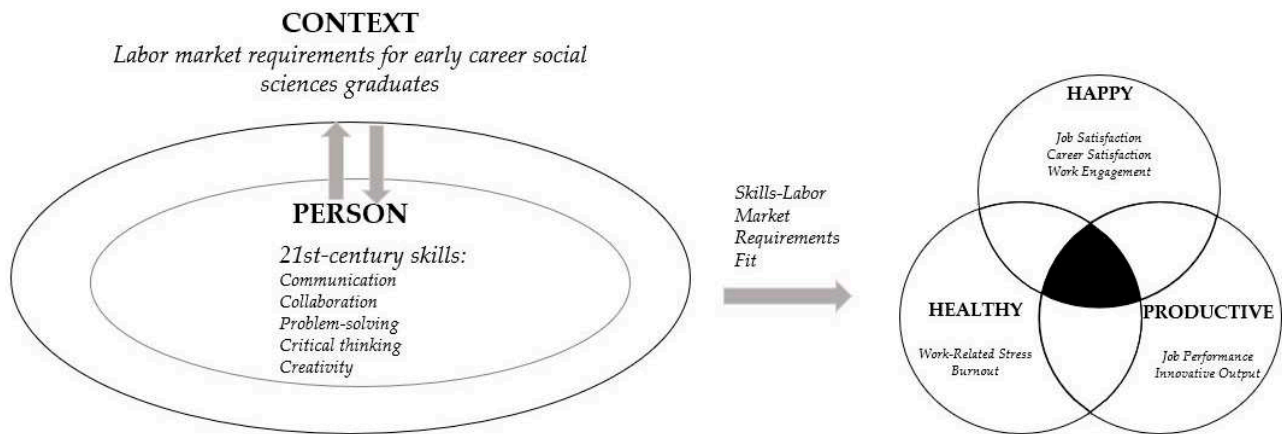


Figure 1. Model of 21st-century skills and sustainable careers for social sciences graduates. Note: based on the model of sustainable careers by de Vos et al. [9].

According to de Vos and others [9], a sustainable career is characterized by three indicators, namely (a) productivity, (b) health, and (c) happiness (see Figure 1). In this conceptualization, the first indicator “productivity” refers to an individual’s strong performance in the current job and having good future job prospects [9]. To start and build a sustainable career, young graduates need to find a job in the first place and then keep their jobs by performing well at work [9]. Composed of different dimensions, job performance is defined as “behaviors or actions that are relevant to the goals of the organization” [33] (p. 704). Individuals who perform well in their jobs not only secure their own employment and career sustainability, but also contribute to the success and productivity of their organizations [34].

In addition to high in-role performance, in today’s fast-changing work environment, graduates need to show innovative behaviors at work [35,36], which are expected to lead to innovative output for the organization [37]. Innovative work behavior refers to “the intentional creation, introduction, and application of new ideas within a work role, group or organization, in order to benefit role performance, the group, or the organization” [38] (p. 288). To illustrate, innovative employees are the ones whose behaviors result in novel outcomes for the organizations, such as the creation of new products or processes [37,39]. By engaging in innovative activities at work, young graduates can contribute to the competitiveness and performance of the organization [36,39].

While being productive at work by performing well and being innovative is crucial for career sustainability, it may also endanger career development by deteriorating one’s health and happiness [40]. According to the model of sustainable careers, the second indicator “health” refers to the dynamic fit of one’s career with physical and mental functions [9]. Employees experiencing physical or mental health issues, such as frequent pain or work-related stress, may withdraw from work and find it difficult to maintain and further develop their careers [41–43]. In line with prior research findings, which have revealed the needs and problems of young employees with a social-sciences degree in today’s workplace (e.g., [17]), we will specifically examine work-related stress and burnout under the indicator of health (see Figure 1).

Work-related stress and burnout are important to examine as possible hindrances of building a sustainable career [9,41]. While work-related stress is defined as perceived stress at work regarding irritating hassles, tough events, and ongoing problems [44], burnout is a psychological syndrome occurring in response to prolonged exposure to work-related

stress [45]. Both these negative experiences at work lead to physical and mental health complaints such as headaches and depression [46,47], and have a negative influence on job performance [48,49], career satisfaction, and life satisfaction [46,48].

The final indicator of sustainable careers, “happiness” entails feeling successful or satisfied with one’s career [9]. When employees are happy, they feel the motivation and energy needed to continue working effectively and efficiently [34], which can facilitate building a sustainable career in the long term [9]. In this research, we focus on work engagement and job and career satisfaction to study the happiness of social sciences graduates.

Work engagement is considered the antipode of burnout [50], and refers to “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” [51] (p. 74). Engaged employees feel energetic and connected to their work [50]. Work engagement results in several positive outcomes, for example, higher levels of job satisfaction (e.g., [52]) and job performance (e.g., [53]).

Satisfaction is the other concept that we investigate under happiness. We focus on both job and career satisfaction, with the latter serving as a central indicator of career success [41]. While job satisfaction is defined as an evaluation of one’s job that results in contentment with and positive feelings about the particular job [54], career satisfaction refers to the positive feelings derived from several aspects of the career as a whole, including payment, advancement, and developmental opportunities [55]. To put it differently, job satisfaction only concerns an individual’s current job situation, whereas career satisfaction is related to the lifetime evaluation of work experiences [56,57]. Both job and career satisfaction negatively impact turnover intentions [58–60]. Additionally, they lead to increased organizational commitment [61,62] and life satisfaction [63].

In sum, bearing three sustainable career indicators in mind, we seek to capture social sciences graduates’ career sustainability by focusing on job performance, innovative output, job stress, burnout, work engagement, and job and career satisfaction in line with the demands and problems which they may encounter while building their careers. Even though the above-mentioned concepts are considered to be separate and distinguishable indicators of sustainable careers (see Figure 1), it is important to emphasize that they are also expected to be interrelated.

2.2. *The Role of 21st-Century Skills in Career Sustainability of Social Sciences Graduates*

As the central actors and owners of their careers, individuals are responsible for making career-related decisions, taking appropriate actions and initiatives when needed, and adapting and reacting to career events and changes [9]. All these responsibilities imply the importance of possessing relevant 21st-century skills in ensuring career sustainability. Twenty-first-century skills enable individuals to adapt to the ever-changing job landscape, navigate through dynamic career environments, and seize opportunities for career growth and advancement [2,64,65].

To examine how 21st-century skills relate to sustainable career development (cf. [31]), we build on the person–environment (P–E) fit theory. The P–E fit theory posits that individuals inherently seek environments that are compatible with their characteristics, including values, needs, and abilities [66]. Achieving a strong fit would lead to positive experiences such as satisfaction. When there is a misfit between their own characteristics and environmental attributes, individuals are expected to face negative outcomes like stress [66,67]. Over the years, in the scope of the P–E fit theory, different fit concepts have been proposed related to the context of work, such as person–organization fit [66]. As the present study addresses careers, the focus is on the person–career fit, which can occur when individuals’ abilities and talents fit the requirements of their past, current and future work environment [68]. Person–career fit is at the heart of managing a sustainable career [9,69]. Individuals with a strong person–career fit experience positive outcomes that foster their happiness, health, and productivity in the long term [68]. Thus, building on the P–E fit theory and the model of sustainable careers, we propose that if social sciences graduates

are equipped with the skills demanded in the labor market, they will develop a stronger sense of person–career fit, which enables them to manage a sustainable career.

According to the framework of Partnership for 21st-Century Learning (P21), which is a generic and widely used framework in the literature [70], 21st-century skills are categorized under three main themes called (i) Learning and Innovation Skills, (ii) Information, Media, and Technology Skills, and (iii) Life and Career Skills. Learning and Innovation Skills include creativity and innovation, critical thinking, problem solving, communication, and collaboration; Information, Media, and Technology Skills involve information literacy, media literacy, and ICT literacy; and Life and Career Skills consist of flexibility, adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership, and responsibility [71].

Building on the findings of a recent review study [31], we specifically focus on communication, collaboration, creativity, critical thinking, and problem-solving skills. The reviewed studies showed that these skills are often required from social sciences graduates in the labor market. For example, the study by Pineda-Herrero et al. [72] demonstrated that these skills were highly valued by employers and graduates of pedagogy and psychology to find and maintain a job and perform well at work. In addition to current labor-market requirements, different studies on what demands will be expected of social sciences graduates also underline that these skills will become more prominent in the future (e.g., [73]). Likewise, numerous skills frameworks that exist in the literature concurrently draw attention to the ever-increasing importance of communication, collaboration, creativity, critical thinking, and problem-solving skills [74]. Furthermore, prior research provides evidence supporting the link between possessing these 21st-century skills and work-related outcomes relevant to sustainable careers. For example, studies have shown that high levels of creativity positively affect involvement in innovation at work [36]; problem solving positively relates to well-being [75,76], and critical thinking is positively associated with work engagement [77].

Overall, drawing on the P–E fit theory, the conceptual model of sustainable careers, and results from previous empirical studies, we formulate the following hypotheses to be tested in this research:

Possessing the 21st-century skills of communication, collaboration, problem solving, critical thinking, and creativity positively relates to H1) happiness (i.e., work engagement, job and career satisfaction) and H2) productivity (i.e., perceived performance and innovative output); and H3) negatively relates to health problems (i.e., job stress and burnout).

3. Methods

3.1. Study Design and Context

This study had a cross-sectional survey design. Participants were early-career graduates of social sciences master's programs in the Netherlands between the years 2018 and 2023. We specifically focused on master's graduates because many social sciences undergraduates directly continue further education before entering the labor market and starting their careers [12,78].

3.2. Sample and Procedure

We recruited participants through the alumni centers of two research universities in the Netherlands and by making announcements on social media channels. Among the respondents, we raffled off ten shopping vouchers each worth EUR 50 as compensation for their participation. Ethical approval was obtained from an ethics committee at a major university in the Netherlands with the approval number ETH2223-0079. The data were gathered through an online survey, which was administered both in English and in Dutch in the spring of 2023. Before data collection, we informed participants about the general purpose, procedure, voluntary participation, and confidentiality of their responses.

A total of 201 graduates participated in this study. Respondents who indicated that they graduated from fields other than social sciences were excluded from the sample.

To determine which studies can be categorized under social sciences, the International Standard Classification of Education (ISCED) 2013 detailed field descriptions were used [79]. Based on the ISCED descriptions, two respondents holding master's degrees in law were excluded from the dataset prior to analyses. Additionally, we removed participants who filled out a small proportion of the survey such as only demographics or who could not provide data on how they feel or perform in their current jobs due to unemployment, being on leave, or following a second master's degree. The final sample consisted of 129 individuals.

Most respondents were female (69%). The mean age was 28.33 years ($SD = 5.48$). Most of the participants obtained their master's degree from the discipline of psychology (20.9%), followed by the disciplines of political sciences (17.8%), educational sciences/pedagogy (17.1%), public administration (14.7%), sociology (10.1%), anthropology, (9.3%) and other social sciences disciplines such as economics (10.1%). Also, the majority were temporarily employed (50.4%), followed by permanent (28.7%) and other employment types (1.6%), such as temporary employment with a view to permanent employment. Additionally, the respondents worked in a wide range of sectors such as universities (24%), government (17.8%), hospitals and health services (12.4%), education (8.5%), business services (6.2%), welfare institutions (5.4%), financial services (2.3%), or information and communication services (2.3%). On average, participants worked 35.5 h per week ($SD = 5.60$) and reported several occupations such as being a PhD candidate (17.4%), psychologist (7.1%), policy advisor (8%), government trainee (7.9%), and ortho-pedagogue (4.7%).

3.3. Measures

The study variables (21st-century skills and career outcomes) were measured with questionnaires that were possible to fill out in English or in Dutch. The items were contextualized to the work context and in some cases slightly rephrased to represent abilities rather than behavioral outcomes to ensure discriminant validity from our outcome measures (e.g., job performance). An example of a changed item is "I am good at participating in team discussions with an open mind" from the collaboration questionnaire, which was previously worded as "I consistently participate in team discussions with an open mind". Where possible, existing Dutch versions were used. The skills and work-related stress questionnaires were translated from English to Dutch. The original and final items are presented in Supplementary Materials, File S1. All the variables were scored on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), except for job satisfaction, where we used a seven-point scale (1 = Completely Dissatisfied to 7 = Completely Satisfied). The total score for each scale was calculated by taking the average of the individual scores on the scale items. All scales were sufficiently reliable, ranging from 0.69 to 0.90.

3.3.1. Twenty-First-Century Skills

Communication skills were measured with an adapted version (cf. [80]) of the twelve-item Communication Competency Scale [81]. The items included "I express my ideas clearly". The Cronbach's alpha reliability was 0.69.

Collaboration skills were assessed with the Self-Assessed Collaboration Skills Scale (SACS; [82]). The scale had eleven items (e.g., "I am good at supporting the efforts of others"). Cronbach's alpha reliability for the scale was 0.73.

Creativity was assessed with four items from the Creative Potential Scale, which measures personal opinions concerning the ability to be creative [83]. Of the original six items, two were removed because they were either too general and/or overlapped with other concepts (cf. [84]; see Supplementary Materials, File S1). An example item was "I am able to try out new ideas". Cronbach's alpha reliability was 0.73.

Critical thinking was measured with fourteen items from the Confidence in Critical Thinking Subscale of the Critical Thinking Toolkit (CriTT; [85]). A sample item was "I can evaluate the arguments of others well". Cronbach's alpha reliability was 0.82.

Problem-solving skills were assessed with the Problem-Solving Confidence Subscale from the Problem-Solving Inventory [86,87]. This measure included eleven items (e.g., “I am able to solve new and difficult problems”). Cronbach’s alpha of the scale was 0.80.

3.3.2. Sustainable Career Indicators

Based on prior research findings showing that job satisfaction can be measured with a single item in a reliable and valid way (e.g., [88]), we assessed job satisfaction with the item “Weighing the pros and cons, how satisfied are you with this job?”.

To measure career satisfaction, we used the five-item Career Satisfaction Scale, which was developed by Greenhaus et al. [89] and has frequently been used in the literature to measure career satisfaction (e.g., [90]). Items included “I am satisfied with the success I have achieved in my career”. Cronbach’s alpha reliability was 0.90.

Work engagement was assessed with the three-item Ultra-Short Work Engagement Scale [91]. The items included “At my work, I feel bursting with energy”. Cronbach’s alpha reliability was 0.84.

Work-related stress was measured with the Work Stress Scale [92,93]. The scale had six items (e.g., “I am usually under a lot of pressure when I am at work”). Cronbach’s alpha reliability was 0.83.

A short version of the Burnout Assessment Tool (BAT) was used to measure burnout [94]. This scale included twelve items (e.g., “After a day at work, I find it hard to recover my energy”). Cronbach’s alpha reliability was 0.89.

To measure perceived job performance, we used Goodman and Svyantek’s [95] task and contextual performance scales. The former scale assesses an individual’s current performance at work, such as achieving the objectives of the job. The latter scale measures organizational citizenship behaviors, such as voluntary actions that extend beyond formal requirements. We used three items for each scale (cf. [96]; e.g., “I achieve the objectives of the job” and “I help colleagues when their workload increases”). Cronbach’s alpha was 0.86 for task performance and 0.70 for contextual performance.

Innovative outputs at work were assessed with five items from the Innovative Output Scale [37]. A sample item was “I produce ideas to improve work practices”. Cronbach’s alpha was 0.85.

3.3.3. Control Variables

Previous studies demonstrated that age, gender, major, weekly work hours, and employment sector might be associated with our study variables, specifically job satisfaction, stress, work engagement, and burnout (e.g., [97,98]). Therefore, we included these demographic characteristics and information on current employment as control variables in our analyses.

3.4. Data Analysis

First, we checked the data for outliers and influential cases and found no distortions or extreme cases. Second, we conducted descriptive statistics and bivariate correlations between study variables in SPSS (Version 29). Third, to test whether possessing 21st-century skills predicts the outcome variables related to career sustainability, we performed path analysis in SPSS Amos (Version 29) with maximum likelihood estimation and using the estimation of means and intercepts for missing data. The model fit was evaluated using the χ^2 goodness-of-fit statistic, Tucker–Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). TLI and CFI values greater than 0.90 are considered representative of a good fit [99], while values close to 0.95 indicate superior fit [100]. An RMSEA value equal to or less than 0.05 is indicative of a good fit, values ranging from 0.05 to 0.08 suggest an adequate fit, and values falling between 0.08 and 0.10 suggest a mediocre fit, while values exceeding 0.10 are considered unacceptable [101,102].

Last, we carried out latent-profile analysis (LPA). We performed LPA by using the tidyLPA package in R (Version 4.2). LPA classifies individuals into homogenous subgroups based on the variables of interest examined in the study [103]. We conducted the LPA with

the recommended three-step approach [104]. In Step 1, we used job and career satisfaction, work engagement, job stress, burnout, job performance, and innovative output as profile indicators. To increase the interpretability of the latent profiles, we used *z*-standardized mean scores of the indicators (cf. [105]). Initially, we started our evaluation with a single-profile model. Then, we increased the profile numbers one by one by investigating whether the inclusion of an additional profile led to superior solutions that were both statistically and conceptually meaningful. We compared each consecutive model to the previous model by checking whether the addition of an extra profile improved the model fit. We considered several fit criteria. We used the Bootstrap likelihood ratio test (BLRT) to compare the model of interest to a model with one fewer profile, with a *p*-value below 0.05 meaning that the current model fits the data better than the previous model [106,107]. In addition, we checked the Akaike information criterion (AIC), Bayesian information criterion (BIC), and sample-size-adjusted BIC (SABIC), with lower values indicating a better fit [107]. Moreover, we checked the entropy statistic, which estimates how well the model separates and classifies individuals for each profile [106,108]. Entropy values closer to the maximum value of 1.00 signify more certainty in profile classification [107,108]. Beyond the statistic tests and indices, we considered the utility (i.e., the profiles should include at least 5% of the sample) and conceptual interpretability of the profiles in line with the recommendations in the literature [103,106].

After selecting the best-fitting model, in Step 2, we assigned the individuals to their most likely profile using the posterior profile probabilities. In Step 3, we examined whether the resultant profiles of career sustainability differed in 21st-century skills.

4. Results

4.1. Descriptive Statistics and Measurement Model

Table 1 displays the means, standard deviations, Cronbach alphas, and bivariate correlation coefficients among all variables. The table shows significant and positive correlations among all 21st-century skills, and several links between skills and sustainable career outcomes, as predicted (see Table 1). For example, communication significantly correlated with all outcome variables (*r* range 0.24 to -0.38 , $p < 0.05$), and creativity showed significant positive correlations with task performance and innovative output ($r = 0.30$ and 0.29 , respectively, $p < 0.05$). The demographic variables showed significant correlations with the outcome variables and were therefore included in our path analyses. Furthermore, correlations between the career-sustainability-related variables exhibited the expected pattern, with strong significant correlations between variables that can be clustered around, respectively, happiness (i.e., job satisfaction, career satisfaction, and work engagement), health problems (i.e., job stress and burnout), and productivity (i.e., task performance, contextual performance, and innovative output).

Before testing our hypotheses, we tested a measurement model including eight latent variables, namely communication, collaboration, critical thinking, problem solving, creativity, happiness, health problems, and productivity. The five latent variables related to skills were indicated by their mean scores, where we corrected for the measurement error of each variable with its reliability score (cf. [109]). We chose to work with mean scores to reduce model complexity and avoid identification problems related to the large number of latent variables, each with several observed indicators [109,110]. The three latent outcome variables were represented by their respective indicators: “happiness” by the mean scores of job and career satisfaction and work engagement; “health problems” by the mean scores of burnout and stress; and “productivity” by the mean scores of task and contextual performance and innovative output. The fit of this measurement model was good (see Table 2); $\chi^2_{(42\ df)} = 73.81$ ($p < 0.01$), CFI = 0.96, TLI = 0.91, RMSEA = 0.08.

Table 1. Means, standard deviations, reliability, and correlation coefficients among study variables.

Construct	Mean	SD	Study Variables														
			1	2	3	4	5	6	7	8	9	10	11	12	13		
Study Variables																	
1. Communication	3.94	0.39	(0.69)														
2. Collaboration	3.98	0.41	0.64 **	(0.73)													
3. Critical Thinking	4.03	0.42	0.44 **	0.50 **	(0.82)												
4. Problem Solving	3.90	0.42	0.53 **	0.57 **	0.58 **	(0.80)											
5. Creativity	3.89	0.56	0.30 **	0.41 **	0.58 **	0.58 **	(0.73)										
6. Career Satisfaction	3.72	0.89	0.34 **	0.27 **	0.17 *	0.32 **	0.12	(0.90)									
7. Job Satisfaction	5.51	1.44	0.27 **	0.11	0.11	0.18	0.02	0.65 **	–								
8. Engagement	3.64	0.88	0.30 **	0.17	0.10	0.23 *	0.09	0.65 **	0.79 **	(0.84)							
9. Burnout	2.08	0.68	–0.38 **	–0.18	–0.08	–0.29 **	0.08	–0.59 **	–0.75 **	–0.70 **	(0.89)						
10. Stress	2.45	0.77	–0.26 **	–0.10	–0.02	–0.27 **	0.10	–0.43 **	–0.61 **	–0.42 **	0.73 **	(0.83)					
11. Task Performance	4.30	0.56	0.31 **	0.35 **	0.33 **	0.51 **	0.30 **	0.19	0.22 *	0.34 **	–0.30 **	–0.18	(0.86)				
12. Conceptual Performance	4.00	0.74	0.31 **	0.40 **	0.10	0.30 **	0.16	0.22 *	0.26 **	0.45 **	–0.28 **	–0.15	0.39 **	(0.70)			
13. Innovative Output	3.54	0.86	0.24 *	0.41 **	0.18	0.29 **	0.29 **	0.20 *	0.32 **	0.47 **	–0.30 **	–0.14	0.45 **	0.54 **	(0.85)		
Control Variables																	
Age	28.33	5.48	–0.14	0.02	–0.01	–0.03	0.10	–0.01	0.11	–0.01	–0.19 *	–0.07	–0.07	0.06	0.14		
Workhours	35.50	5.60	0.08	0.19	0.21 *	0.21 *	0.12	0.29 **	0.15	0.19	–0.13	–0.12	0.08	0.08	0.02		
Gender ^a	0.29	0.45	–0.29 **	–0.19 *	–0.09	–0.17	–0.12	–0.10	0.04	–0.03	–11	–0.06	–0.11	–0.15	–0.25 **		
Internship ^b	0.43	0.50	0.02	–0.01	–0.13	0.03	0.05	0.20 *	0.14	0.15	–0.18	–0.04	0.15	0.03	0.03		
Major ^c	0.05	0.23	–0.01	–0.06	–0.07	–0.07	–0.05	–0.06	–0.23 *	–0.11	0.17	0.02	–0.17	–0.23 *	–0.26 **		
Sector ^d	0.03	0.17	–0.19 *	0.02	0.11	0.02	0.03	–0.23 *	–0.30 **	–0.32 **	0.36 **	0.24 *	0.11	–0.20	–0.15		
Sector ^e	0.07	0.26	–0.04	–0.10	–0.07	–0.06	0.00	–0.26 **	–0.23 *	–0.17	0.16	0.07	–0.10	–0.19	–0.06		
Sector ^f	0.07	0.25	0.03	0.02	–0.01	–0.04	0.01	0.00	0.15	0.20 *	–0.10	–0.07	0.11	0.20 *	0.22 *		

Note. Sample sizes vary due to missing data. N ranges between 96 and 129 individuals. Cronbach alphas are shown on the diagonal in brackets. ^a 1 = male (29%), 0 = female (69%) or other (2%); ^b 1 = conducted a practical internship, 0 = not; ^c 1 = major is urban geography, 0 = not; ^d 1 = sector is information and communication services, 0 = not; ^e 1 = sector is business services, 0 = not; ^f 1 = sector is welfare institutions, 0 = not; * $p < 0.05$, ** $p < 0.01$.

Table 2. Fit indices for the tested models.

	χ^2	df	$\Delta\chi^2$ ^a	Δdf	CFI	TLI	RMSEA
1. Measurement Model	73.81 **	42	-	-	0.96	0.91	0.08
2. Structural Model 1 ^b : Predictors, covariates, and outcome variables	241.38 ***	98	167.57 ***	56	0.83	0.59	0.11
3. Structural Model 2: Only significant paths	258.52 ***	111	17.14	13	0.82	0.63	0.10
4. Final Model ^c : Structural Model 2 with covarying residuals	187.31 ***	110	-71.21 ***	1	0.91	0.81	0.07

^a $\Delta\chi^2$ value compares the current model to the previous model. ^b We corrected the relationships with covariates, which showed significant correlations with outcome variables. ^c The residuals of “happiness” and “health problems” were allowed to covary. ** $p < 0.01$, *** $p < 0.001$.

4.2. Hypotheses Testing: Relationships between Skills and Indicators of Career Sustainability

To investigate the hypothesized relationships between possessing 21st-century skills and indicators of sustainable careers, we fitted alternative models to the data (see Table 2). All these models were corrected for significant control variables (i.e., age, major, and employment sector, see Table 1). We tested a model including all the regression paths from skills to the outcome variables (Structural Model 1). The relatively poor fit of this model suggested considerable room for improvement. Next, we tested a model where we removed the non-significant paths from predictors and covariates to happiness, health problems, and productivity. This model with only significant paths also had a poor fit (see Table 2), but the model fit did not significantly differ as compared to the more complex Structural Model 1. Hence, we used the more parsimonious Structural Model 2. Finally, we allowed the residuals of the latent well-being constructs to covary based on prior research findings, showing strong evidence for the link between happiness and health indicators (e.g., [111,112]). Adding these covariances in the model substantially improved the model fit (see Table 2, $\Delta\chi^2_{(1\ df)} = -71.21, p < 0.001$) and led to the final model (see Figure 2), which yielded a reasonable fit to the data: $\chi^2_{(110\ df)} = 187.31 (p < 0.001)$, CFI = 0.91, TLI = 0.81, RMSEA = 0.07.

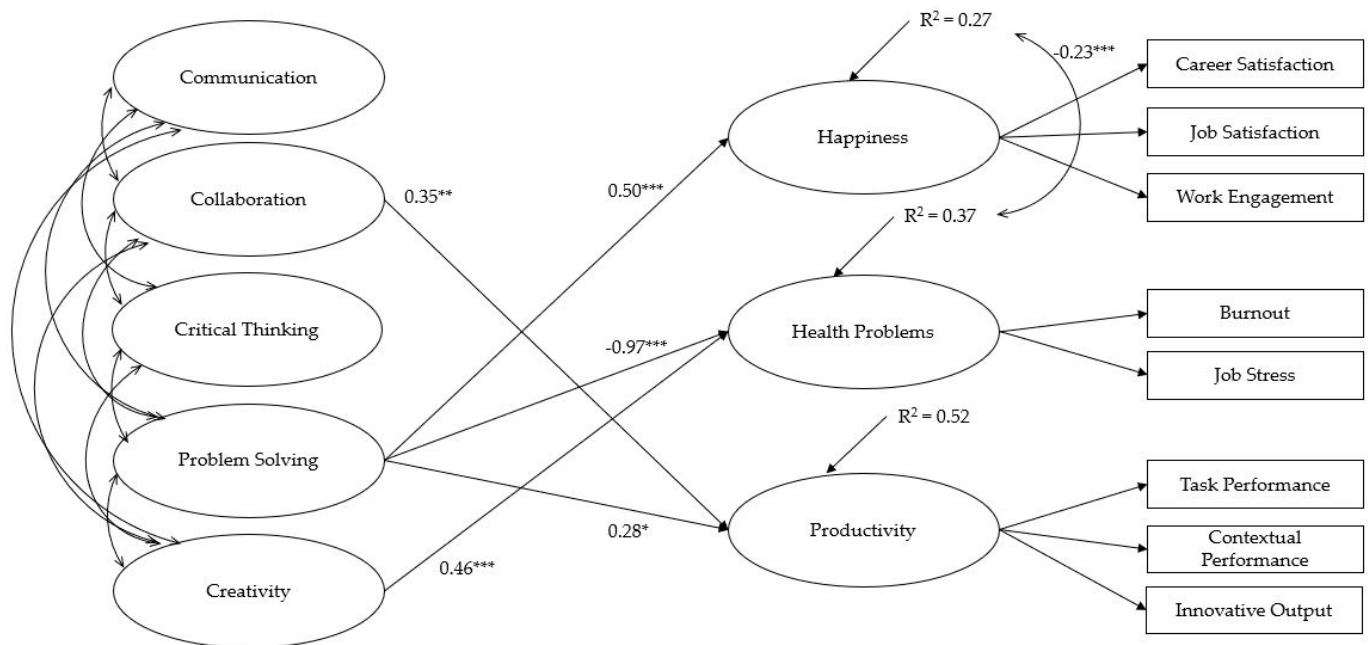


Figure 2. Final model showing significant paths from 21st-century skills to sustainable career indicators. Note. N = 129. Relationships are corrected for age, major, and employment sector; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In accordance with Hypotheses 1, 2, and 3, the results revealed that after controlling for age, major, and employment sector, problem-solving skills significantly predicted all indicators of sustainable careers, namely happiness, health, and productivity, in the expected directions (paths were, respectively, $B = 0.50, S.E. = 0.15, \beta = 0.32,$

$p < 0.001$; $B = -0.97$, $S.E. = 0.15$, $\beta = -0.59$, $p < 0.001$; and $B = 0.28$, $S.E. = 0.11$, $\beta = 0.32$, $p = 0.010$). This finding indicates that individuals who perceive themselves as possessing strong problem-solving skills tend to consider themselves happy and productive while facing fewer health problems at work. Additionally, collaboration skills showed a positive relationship with productivity, after controlling for major and sector ($B = 0.35$, $S.E. = 0.11$, $\beta = 0.38$, $p = 0.002$). Critical thinking and communication skills did not significantly predict any of the indicators of sustainable careers.

Contrary to our initial expectations, our analysis revealed that after accounting for age and employment sector, creativity positively related to health problems ($B = 0.46$, $S.E. = 0.10$, $\beta = 0.37$, $p < 0.001$), suggesting that individuals who indicate that they possess strong creativity skills experience higher levels of stress and burnout at work. However, creativity did not exhibit a significant bivariate correlation with either stress or burnout (see Table 1). When we conducted additional exploratory regression analyses, we found that these relationships were only significant and positive after adding problem solving into the regression model (see Supplementary Materials, File S2), revealing that problem solving suppresses these relationships. This suppressor effect indicates that problem solving may prevent creative individuals from facing stress and burnout at work.

4.3. Latent Profiles of Career Sustainability in Early-Career Social Scientists

With the person-centered approach (i.e., by conducting LPA), we aimed to find out whether different profiles of career sustainability exist in early-career social sciences graduates and to examine whether and how graduates assigned to these possibly existing profiles may differ in possessing 21st-century skills. Table 3 represents the LPA results, including the fit indices and entropy values of six different profile models. The BLRT values demonstrated that the fit significantly improved with the addition of an extra profile until the six-profile model. Additionally, the two-profile model had substantially lower values for AIC, BIC, and SABIC compared to the one-profile model, while the entropy was the closest to 1.00 (0.96). Compared to the other models, we found that the distinctions between the profiles in three-, four-, and five-profile models were not clear-cut, and there was some commonality or similarity between the groups (see Supplementary Materials, File S3), which made it difficult to differentiate between profiles and thus to theoretically interpret the results. Consequently, the two-profile model was selected as the best fit to the data, serving as both a statistically and conceptually superior solution.

Table 3. Model fit statistics of the latent-profile analysis.

Profile Numbers	AIC	BIC	SABIC	Entropy	BLRT p
1	2952.66	2998.41	2947.81	1.00	
2	2696.84	2768.34	2689.27	0.96	0.01
3	2578.99	2676.22	2568.69	0.87	0.01
4	2558.90	2681.87	2545.88	0.84	0.01
5	2550.40	2600.11	2534.65	0.81	0.04
6	2556.59	2731.04	2538.12	0.81	0.69

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SABIC = Sample-size Adjusted Bayesian Information Criterion; BLRT = Bootstrap likelihood ratio test.

In Figure 3, we present a visual illustration of the two profiles using standardized z-scores of the variables that we used as profile indicators, with 0 representing the sample mean. The first profile contained most of the participants (89.92%, $n = 116$). This profile was characterized by lower levels of stress and burnout and higher levels of job and career satisfaction, work engagement, performance, and innovative output than the other profile. Consequently, we labeled this profile “sustainable careers”. The second profile included 10.08% of the graduates ($n = 13$). The individuals in this profile demonstrated lower levels of engagement, satisfaction, performance, and innovative output, and higher levels of stress and burnout than the first profile. Therefore, we named the second profile “non-sustainable careers”. An interesting finding is that although individuals in the “sustainable

careers” profile showed slightly higher job performance than the individuals from the “non-sustainable careers”, the difference was not overly substantial (see Figure 3). This indicates that early-career social sciences graduates tend to show similar levels of job performance even when they are less happy and suffer from stress and burnout at work.

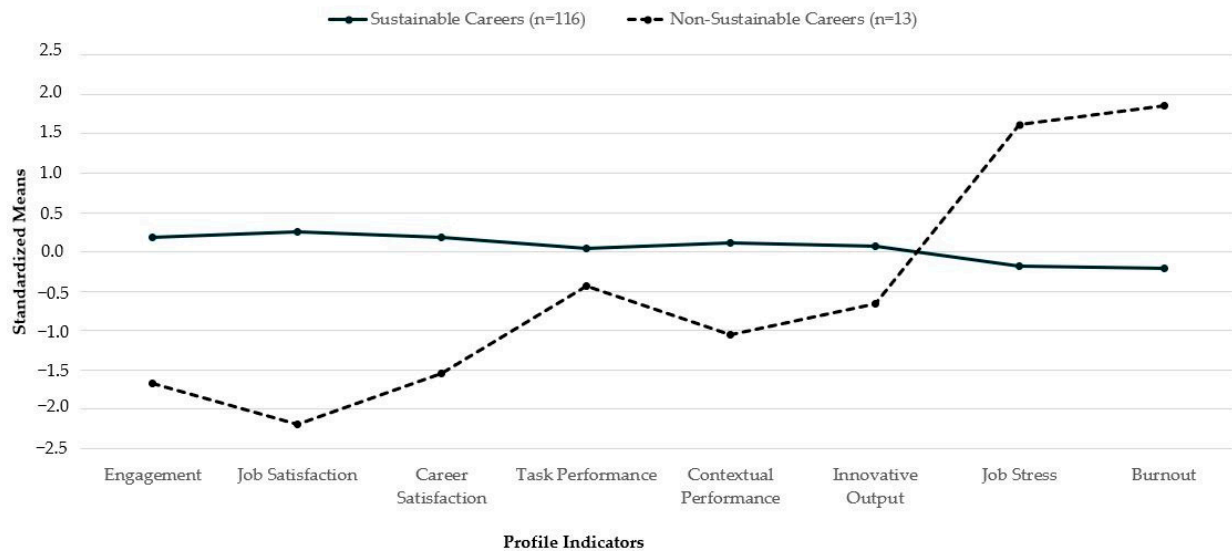


Figure 3. Indicator patterns in two-profile model.

Furthermore, to test whether there were differences in possessing 21st-century skills across these two profiles, we performed independent sample *t*-tests. We found that the groups significantly differed in communication and collaboration skills (Cohen’s *d* value was 0.86 and 0.60, respectively). The individuals within the “sustainable careers” profile reported higher levels of communication and collaboration skills compared to those in the “non-sustainable careers” profile, $t(127) = 2.93$, $p = 0.004$ with a difference of 0.33 (95% *CI*, 0.11 to 0.55) for communication skills, and $t(127) = 2.04$, $p = 0.04$ with a difference of 0.24 (95% *CI*, 0.01 to 0.48) for collaboration skills. For the remaining three skills—critical thinking, problem solving, and creativity—*t*-test analyses did not yield significant differences.

5. Discussion

This study aimed to examine which specific 21st-century skills can help social sciences graduates develop a sustainable career after their graduation. To investigate this, we posed two research questions and adopted both a variable-centered (i.e., path analysis) and person-centered (i.e., LPA) approach. The first research question concerning the link between possessing skills and building sustainable careers was answered using path analysis. The results revealed that self-reported collaboration and problem-solving skills were significantly related to different indicators of sustainable careers among social sciences graduates (i.e., happiness, health, and productivity), supporting H1, H2, and H3. Thus, this study underlines the pivotal role played by collaboration and problem-solving skills in developing a sustainable career for social sciences graduates. Acquiring and strengthening these skills can not only act as a safeguard against negative workplace experiences such as stress and burnout, but can also serve as a catalyst for enhancing one’s happiness and productivity at work.

These findings confirm previous research results. For instance, problem solving was found to have a positive association with the general health of family caregivers [75] and with the work-related well-being of firefighters [76]. Manzoor et al. [113] presented evidence supporting a positive relationship between teamwork and employee performance. Likewise, Hanaysha [114] demonstrated its link with employee productivity among university staff. Moreover, this study builds on the findings of a recent systematic review of the literature, which uncovered that these skills are considered to be important for the career

sustainability of social sciences graduates by both graduates themselves and potential employers [31].

Our path analysis unexpectedly demonstrated that creativity related positively to job stress and burnout. While one can find some evidence or explanations supporting these positive relationships in the literature (e.g., [115,116]), the relationship between creativity and stress is considered complex, and it is important to differentiate between perceived creativity and engaging in creativity as a job demand [117]. In their daily study, Henderson and her colleagues [117] showed that engaging in more creative activities was related to higher perceived stress. However, they also found that individuals who perceived themselves as more creative experienced less stress. Their findings underscore the importance of individual perceptions towards creativity in understanding its impact on stress levels. Their latter finding aligns with our initial hypothesis (i.e., negative relationship between perceived creativity and health problems), which did not receive support in our study. In our study, the absence of a significant bivariate correlation between self-reported creativity and either stress or burnout (see Table 1) suggested the presence of a suppressor effect. Additional exploratory regression analyses (see Supplementary Materials, File S2) revealed that the relationship was influenced by another key characteristic that creative individuals often demonstrate, namely problem-solving skills. This finding implies that problem-solving skills help prevent experiencing stress and burnout at work. If people with creative skills do not also possess strong problem-solving skills, they could be more prone to experiencing job stress and burnout than people with less creative skills.

Our path analysis did not support the relationships between communication and critical thinking skills and any of the sustainable career indicators. One potential reason for these findings could be the presence of a third variable influencing these relationships, leading to inconclusive results. For example, personality traits might play a moderating role in these relationships. There is evidence suggesting that specific personality traits, such as extraversion, are associated with higher levels of happiness or subjective well-being (e.g., [118]). Personality traits have also been linked to the self-perception of communication skills, with studies profiling different traits in relation to communication skills [119]. Thus, personality traits may influence how individuals perceive themselves in terms of possessing communication skills.

To answer the second research question regarding the identification of subgroups in social sciences graduates based on sustainable career indicators, we employed a person-centered approach using LPA. This approach enabled us to explore sustainable careers as a multidimensional construct within individuals. The existence of two profiles among early-career social sciences graduates was demonstrated, labeled sustainable and non-sustainable careers [9]. This finding supports a recent study by Curado and others [120], who found two clusters of sustainable careers based on three indicators, namely well-being, job satisfaction, and organizational citizenship behavior. We chose the same labeling as in this recent study (i.e., sustainable vs. non-sustainable careers), because being consistent with the terminology used in the literature contributes to cumulative science [121].

In line with the model of sustainable careers [9], the individuals in the “sustainable careers” profile experienced more work engagement, were more satisfied with their jobs and careers, reported higher performance and innovative outputs, and faced less stress and burnout compared to the other profile, “non-sustainable careers”. Potentially, they were happy, healthy, and productive at the same time [9]. Most of the respondents (i.e., 89.92%) were assigned to the “sustainable careers” profile, which is a positive finding. This suggests that a substantial proportion of recent social sciences graduates in the early stages of their careers are making noteworthy progress in terms of sustainable career development. However, the other group also exists and needs attention. A notable finding is that despite experiencing lower levels of happiness and more health problems, graduates in the “non-sustainable careers” profile still rated their job performance as comparable to that of graduates with a sustainable career profile. This resiliency is most probably driven by their intention to secure their future employability. Moreover, the group comparisons of these

two profiles on their self-reported possession of 21st-century skills revealed that individuals who showed a sustainable career pattern reported higher levels of communication and collaboration skills. Therefore, partly corroborating the results of path analysis, our LPA findings underscore the importance of effective communication and collaboration in the context of sustainable career development for early-career social scientists.

Overall, the variable-centered approach using path analysis enabled a comprehensive exploration of the overarching patterns across the entire sample, offering a broad perspective on the relationship between 21st-century skills and sustainable careers. On top of that, the person-centered approach, conducted through LPA, enhanced this understanding by providing a nuanced perspective. This approach allowed us to pinpoint distinct profiles within the sample that are also expected to exist in the population (i.e., social sciences graduates).

5.1. Implications

Our findings contribute to the literature on career sustainability in various ways. For examining the link between skills and sustainable career development, we approached sustainable careers as a multidimensional construct consisting of happiness, health, and productivity, which were indicated by various work-related variables. Also, this study responds to the call for using a person-centered approach more frequently in the field of work and organizational psychology, in which this approach is scarcely used [105], and contributes to the validation of the model of sustainable careers. In this study, we presented evidence for the relationship between possessing 21st-century skills and sustainable career development from the perspectives of early-career social sciences graduates.

Moreover, our study has important implications for practice. Higher education institutions should critically examine their curricula if and to what extent they teach 21st-century skills, especially communication, collaboration, and problem-solving skills, in their programs to ensure that graduates are well-prepared for the dynamic workforce and for developing sustainable careers. The finding related to the suppressor effect of problem solving on the relationships between creativity and job stress as well as burnout emphasizes the significance of integrating creativity training with problem-solving skills in higher education programs. Such a combination could potentially protect creative students from developing work-related stress and burnout in their careers.

The results also have implications for employees to acquire or develop 21st-century skills for safeguarding their career sustainability, and for employers to provide their employees with opportunities to train and develop these skills in their workplace. In contexts where creativity is cherished, such as in creative industries [122], organizations and employees need to be aware that while creativity is valuable in the workplace, it may come with a potential downside in terms of increased stress and burnout. Thus, fostering problem-solving skills can help individuals harness their creative abilities effectively without succumbing to stress or burnout. With this aim, tailored training programs or workshops can be designed to improve problem-solving skills in creative professionals.

5.2. Limitations and Future Directions

This study has some limitations that need to be acknowledged. An important limitation is that our results are based on cross-sectional data, meaning that data were collected at one single moment and thus represent a snapshot in time. As contextual and individual factors can vary over time, the use of a single-measurement moment cannot capture the dynamic nature of career sustainability over time. It is also not possible to draw firm conclusions about causal relationships between study variables. Additionally, common method variance may have inflated the covariation between the different constructs. To address this limitation and gain a more comprehensive understanding of how 21st-century skills help social sciences graduates develop a sustainable career over time, future research could benefit from longitudinal designs that track changes and developments over an extended period.

Another limitation of this study is the small sample size, which restricts the generalizability of our findings. Our sample involved graduates who completed a social sciences master's degree in the Netherlands between the years 2018 and 2023. The geographic, timeframe, and disciplinary boundaries of our sample limit the generalizability of our results to graduates from other countries, time periods, or academic disciplines. Therefore, the conclusions drawn from this study should be interpreted with caution. Further research with larger samples would extend the validity of our findings and allow for a broader representation of the population.

Moreover, it is important to note that all five skills that we investigated in this study were measured indirectly through self-reports. While there are substantive advantages of using self-assessments in measuring skills, such as having the opportunity to examine a wide range of skills in a study [123], in the case of this research, self-reports are inherently susceptible to biases. In the self-assessment of skills, individuals might overestimate or underestimate their own skills, or they might tend to give socially desirable answers [124]. Therefore, future research may also benefit from more objective or direct assessments of skills such as using computer-based performance tests in addition to self-reports to enhance the robustness of our findings.

In our study, we focused on possessing skills as a component of person–career fit. However, future research can expand on this by examining the role of other components, namely individual values and needs (cf. [66]) in building sustainable careers. Moreover, scholars can also link possessing 21st-century skills to career attractiveness, particularly through the lens of expectancy theory, used for predicting job performance and satisfaction in the literature [125]. Possessing 21st-century skills could help individuals perceive themselves as more capable of fulfilling job responsibilities and achieving career satisfaction and success. Consequently, it could potentially enhance individuals' career expectations in terms of happiness and productivity, thereby influencing how they perceive the attraction of their careers.

6. Conclusions

This study underscores the importance of 21st-century skills in building sustainable careers. Our findings provide insights into which 21st-century skills help social sciences graduates to build sustainable careers. In particular, collaboration, communication, and problem-solving skills were found to be important for social sciences graduates' career sustainability. Possessing and strengthening these skills can help individuals mitigate negative experiences at work while enhancing productivity. Our research, utilizing both variable-centered and person-centered approaches, not only advances the understanding of the role 21st-century skills play in career sustainability but also validates the model of sustainable careers. Overall, this study contributes to the research fields of 21st-century-skills training and career sustainability and serves as an initial exploration of the research topic, providing a foundation for future investigations with larger samples in longitudinal designs.

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/su16083409/s1>, File S1: Table S1. Measures and Related Items; File S2: Table S2. Coefficients of the Regression Models without Problem-Solving; Table S3. Coefficients of the Regression Models with Problem-Solving; File S3: Figure S1. Indicator Patterns in Two, Three, Four and Five-Profile Models.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available in Open Science Framework at https://osf.io/6ta9v/?view_only=36b65555cc2240a4a53e30e0e7e35f67 (accessed on 3 March 2024).

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