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Dimensions of Career Decisions: A Validated Tool for Romanian High School Students

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Abstract: The present study aimed to develop and validate a brief, two-factor scale assessing career decision-making in high school students. The scale captures the following two key dimensions: (1) access to resources and exploration of career options and (2) career choice self-efficacy. Exploratory and confirmatory factor analyses were conducted on data from a sample of 778 Romanian high school students. The results supported a two-factor structure with good internal consistency and construct validity. Measurement invariance across gender revealed configural invariance, although metric and scalar invariance were not confirmed, suggesting potential differences in how male and female students interpret career decision constructs. No significant gender differences emerged in mean scores, yet students in technological educational tracks reported significantly greater access to career-related resources than their peers in theoretical and vocational profiles. These findings underscore the scale's sensitivity to educational context and its potential utility in comparative studies and needs assessments. Future research should examine the scale's predictive validity, longitudinal stability, and cross-cultural applicability. This tool offers a practical means to assess career decision-making processes and inform targeted interventions in educational and counselling settings.

Keywords: career decisions; career choice self-efficacy; need for support; validation study; high school students

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1. Introduction

Career decision-making in adolescence is a complex and multifaceted process, determined by the interaction between individual, social, and contextual influences. In contemporary society, marked by rapid advancement in technology, shifts in the labour markets and rising educational demands have led to uncertainty regarding career trajectories to become increasingly prevalent. Consequently, adolescents are now facing increasing pressure to define their vocational identity and make meaningful educational choices early, often with limited information and support.

Classical career theories (Gottfredson, 1981; Holland, 1997; Super, 1980) and more recent contemporary research highlight the importance of psychological resources such as self-efficacy, personality traits (the Five-Factor Model being the most widely cited), and social support in influencing vocational choices. Furthermore, models of decision-making styles (Harren, 1979; Savickas et al., 2010; Scott & Bruce, 1995) focus on how adolescents cope with the pressures of choice, from systematic exploration as an adaptive strategy to avoidance or impulsivity as maladaptive patterns. Family dynamics, peer relationships,

and interactions with educators further shape how career choices are made and maintained. Despite the rich theoretical background, there is an evident gap in accessible, developmentally appropriate tools for assessing the psychological and contextual dimensions of career decision-making among adolescents. Most instruments are often designed for adult populations or focus narrowly on specific aspects of career choice, such as interests or values, rather than the broader cognitive–emotional and interpersonal dynamics involved.

This study addresses this gap by proposing a new, integrated measurement tool tailored to high school students, grounded in Social Cognitive Career Theory (SCCT). SCCT provides a comprehensive framework for understanding career-related behaviour, encompassing models of career interest development, choice, and performance, as well as career self-management (Lent & Brown, 2019). A key strength of SCCT is its adaptability to diverse cultural and educational contexts (Zhao et al., 2021), making it particularly suited for assessing career processes among Romanian adolescents. While existing SCCT-based measures have primarily targeted post-secondary or adult populations, there is limited focus on the career decision-making needs of high school students (Guo, 2025; Rogers et al., 2008). By focusing on constructs such as self-efficacy, contextual support, and outcome expectations, this study contributes to both the theoretical refinement of SCCT in adolescent contexts and the practical advancement of career assessment tools.

Developing a validated scale for this for high school students is essential for several reasons. First, it enables a more nuanced understanding of how adolescents navigate career decisions during a critical developmental window. Second, it provides educators, counsellors, and psychologists with a reliable instrument for the early identification of students who may need targeted support. Third, such a tool can inform the design of career guidance programmes that are both evidence-based and responsive to the real challenges young people face. By capturing key dimensions such as self-efficacy, exploration behaviour, and perceived support, this research contributes not only to the academic field of career psychology but also to the practical work of supporting students in building agency and clarity in their future career decisions.

Regardless of the main direction of the high school (theoretical, technological, or vocational), students select their track after completing lower secondary education, around the age of 14–15, based generally, but not only, on their academic performance and preferences. Career guidance services are provided by school counsellors. The education policies in Romania mention that the presence of a school counsellor is established by reference to a maximum of 500 pupils, maximum of 500 pupils and preschoolers, or maximum of 300 preschoolers. Starting from these aspects regarding the infrastructure of school counsellors in Romania, as well as from socio-cultural factors, such as the differences between urban and rural areas, the social media influences, and the economic aspects, we can say that the career decision process of the students is strongly impacted (Petre et al., 2025). For example, rural–urban disparity negatively impacts the career decision process due to the fact that in rural or disadvantaged environments students have fewer career guidance opportunities which reduces their confidence in their own abilities, as well as how students develop their personal interests and goals, and their perception related to the expectation and support (World Bank, 2024).

Key SCCT variables are also influenced by other specific aspects such as family socioeconomic status, family structure, or cultural values (McWhirter et al., 2019). It is known that low-income families, especially in rural areas, are less inclined to support children to continue their studies. Single-parent families or those with parents abroad leave the school decisions in the care of relatives or even the student, which negatively impacts the career guidance. Another socio-cultural factor may be the lack of educational resources such as an Internet connection, a computer, or remedial learning activities.

The availability and quality of career guidance services in schools vary significantly. High school students make career decisions not only according to their abilities and desires, but also according to the influence of their family, access to resources, and their perceptions related to the labour market. Students most often seek guidance from family members first, followed by peers. In comparison, in school, teachers are most often consulted, then tutors, and only then school counsellors. The socio-cultural context in Romania emphasizes the relevance and importance of developing educational policies that reduce discrepancies and tailor tools to evaluate and support a student's career decision process so that they develop informed and authentic choices (Eurydice, 2024).

A better understanding of how adolescents make career decisions and the factors that help or hinder them can lead to more effective interventions and a smoother transition from school to work or further education.

2. Literature Review

2.1. Career Decision-Making in Adolescence

This study is based on the SCCT (Lent et al., 1994, 2000), one of the most used theories explaining the mechanisms that influence career decision-making, especially among adolescents. SCCT describes the interaction between self-efficacy, outcome expectations, personal goal setting, and contextual influences such as resource availability and social support systems. The construction of the scale includes elements referring to resources and the exploration of options, support, and career choice self-efficacy, which aligns closely with SCCT's core components. Specifically, the dimensions related to resources and exploration reflects environmental and contextual supports (access to guidance, resources, and encouragement from parents, teachers, or school counsellors can enhance adolescents' career self-efficacy and outcome expectations, thereby influencing their exploration behaviours and decision-making), while the self-efficacy captures the individual's confidence in making informed career decisions. Using this theoretical framework, the present study offers a deeper insight into the psychological and contextual variables influencing adolescents' career development, reinforcing the scale's relevance for both research purposes and practical use in educational contexts.

Extensive research has investigated career decision-making processes during adolescence, with particular attention paid to the factors influencing high school students' choices, the development of vocational identity, and gender-based differences in career interests. A considerable number of longitudinal studies have also explored how adolescents' career decisions evolve over time, illustrating the multidimensionality of this developmental task. These investigations are crucial for understanding the mechanisms that underline career-related choices and for designing effective guidance programmes that support adolescents in navigating these important transitions.

Recent research explores how social, technological, and economic transformations shape adolescents' career trajectories. Globalization, shifting labour market demands, and the increasing influence of digital technology are altering how young people perceive, evaluate, and plan for their future roles in the workforce (Guo, 2025; Xu, 2023). These changes have intensified the need for adolescents to make complex and often high-stakes decisions regarding their education and future careers, often under conditions of uncertainty. The COVID-19 pandemic, for instance, further disrupted established pathways and increased ambiguity in the decision-making process (Jemini-Gashi & Kadriu, 2022).

Supporting adolescents before the so-called "moment of choice" has become increasingly relevant, particularly through career education programmes that are tailored to cognitive development and provide broad exposure to career options (Kim & Lee, 2023). Forming a clear occupational identity requires adolescents to integrate self-knowledge with

an understanding of the world of work, an evaluative process that begins in earlier developmental stages and crystallizes during high school (Rogers et al., 2018). As Gottfredson (1981) points out, the success of this process depends not only on the available information but also on the quality of the decision-making itself.

The career decisions of high school students in Romania are influenced not only by individual factors but also by a complex set of socio-cultural and structural variables. The social cognitive model of careers, proposed by Lent and Brown (2013, 2019), explains how self-efficacy, contextually available support, outcome expectations, and self-imposed boundaries influence goal setting and planning as well as flexibility in decision-making, culminating in adaptive career behaviours. In Romania, the socio-cultural context including parents' educational background, community norms and perceptions, and the availability of professional role models, impact this self-regulatory process. Students from rural areas have a clear understanding of their abilities, interests, and career goals, but due to systemic barriers and lack of social support they tend to develop low self-efficacy and negative expectations about their professional success. In addition, in the absence of an educational or familial context that promotes autonomy, many students accept decisions influenced by parents' opinion, geographical proximity, or local community norms. SCCT has been shown to be readily applicable in non-Western and less-studied contexts by integrating the impact of cultural expectations, the structure of opportunities, and social modelling on self-efficacy and career expectation formation (Guan et al., 2017; Lent & Brown, 2013).

Overall, career decision-making in adolescence is a complex process that involves multiple factors, including external conditions, and requires flexibility and self-awareness. Understanding how adolescents manage these challenges is important in developing supportive systems that support informed and autonomous career decision-making.

2.2. Resources and Exploration of Career Options in Adolescence

Following the SCCT framework (Lent et al., 2000), the exploration of a prospective career in adolescents stems from the interplay between personal factors, contextual supports, and perceived barriers. Effective career decision-making depends not only on individual and personal resources but also on the quality and accessibility of interpersonal, institutional, and informational resources. Among the personal resources, self-efficacy is one of the most important factors, having a positive effect on the engagement in decision-making processes and also on employability. Important personal resources include personality traits such as openness to experience and conscientiousness, which could be considered antecedents of proactive exploration behaviours (John & Srivastava, 1999) and career adaptability (Savickas, 2005).

Interpersonal resources are also important in adolescence. Family, through parental support and modelling, provides emotional validation and advice (Dietrich & Kracke, 2009). Peers shape the development of views on careers and gender stereotypes. Mentors, such as teachers and counsellors, offer guidance and encouragement (Schwartz et al., 2013).

From an institutional perspective, schools serve as key environments for fostering career exploration. Programmes integrating self-assessment, labour market research, and long-term planning have proven effective (Gati & Saka, 2001). Access to high-quality counselling services and experiential opportunities such as volunteering or workplace visits further enhances career readiness (Hirschi, 2009).

Despite the availability of resources, many adolescents encounter barriers like lack of information, decision-making pressures, economic limitations, and restricted access to positive role models (Lent et al., 2000). Career exploration during adolescence is a dynamic, complex process shaped by the quality of available resources and supports. In an increasingly volatile socio-economic context, sustained investment in comprehensive

support systems is critical to empower young people to navigate their career pathways with autonomy, clarity, and adaptability.

2.3. Gender and Educational Domain Differences

Although adolescence represents a key period for exploring career options, gender differences continue to influence vocational choices. In addition to developing a psychometrically valid tool, this study also examines differences in career decision-making based on gender and educational track. From the perspective of SCCT, inconsistent findings have been reported regarding gender differences; whilst some studies (Lent & Brown, 2013) report that the SCCT model was invariant across samples of men and women, other studies reported that female students had lower confidence in their ability to successfully complete the chosen degree (Inda et al., 2013). Other studies suggest that female students perceive higher career barriers (Lindley, 2005) and lower decision-making self-efficacy (Betz & Luzzo, 1996), while men often report higher self-efficacy and more positive outcome expectations, particularly in STEM-related domains (Hackett et al., 1992). Studies have shown that boys tend to report higher self-efficacy in scientific, technological, and object-oriented fields, while girls show greater interest in social and artistic careers (Lasselle et al., 2021; Stoet & Geary, 2022). These patterns are shaped by cultural, social, and familial factors, including parental modelling and societal stereotypes. Gender disparities in career aspirations appear even in countries with higher levels of gender equality, suggesting that personal interests, influenced by deeper socio-cultural dynamics, continue to play a significant role (Stoet & Geary, 2022).

Beyond gender, several studies have highlighted grade-level differences in career maturity. As students advance through high school, they typically gain more exposure to educational and vocational experiences, which enhances their readiness to make informed career decisions. Studies found that older high school students had fewer difficulties in making career choices as compared to their younger counterparts, indicating that there is some form of forward progression in career decision-making skills with age (Duru, 2022). Similarly, a cross-cultural study of Korean and American high school students showed that career maturity increases with age and grade level, likely due to greater cognitive development and increasing social expectations regarding post-secondary planning (Lee, 2001).

Reading the educational domain, existing research suggests that students enrolled in vocational tracks often have earlier and more structured exposure to career-related experiences compared to those in theoretical (academic) tracks. Vocational education programmes typically emphasize applied skills, work-based learning, and direct preparation for employment, which can enhance students' career exploration and decision-making processes. In contrast, students in theoretical tracks are usually more oriented toward academic progression and higher education pathways, with less immediate focus on career decision-making during secondary education (Gessler & Howe, 2015). Moreover, research highlights that vocational students sometimes demonstrate more career certainty, but less flexibility compared to their theoretical peers, who may experience more indecision but also keep broader options open for longer (Schoon & Polek, 2011). These findings suggest that educational pathways create distinct environments of resources and requirements that shape adolescents' career decision-making processes.

2.4. Career Choice Self-Efficacy

Self-efficacy, as a key cognitive construct, has been shown to positively influence adolescents' career-related behaviours across both general education and physical education domains. Career decision-making self-efficacy is a critical psychological construct influenc-

ing high school students' ability to make informed and confident academic and vocational choices. Recent research (Stead et al., 2022) highlighted a meaningful link between career adaptability and self-efficacy. Similarly, findings from a recent meta-analysis (Kleine et al., 2021) reinforced that higher levels of self-efficacy are consistently associated with greater engagement in career exploration.

Career self-efficacy refers to an individual's confidence in their ability to effectively organize and carry out the actions necessary for making informed career decisions (Lent et al., 2000). From the perspective of the SCCT (Lent et al., 2000) career self-efficacy interacts with contextual factors such as social support and personal variables to influence career decision outcomes. Adolescents who believe in their capacity to manage the career decision-making process are more likely to explore options, commit to goals, and navigate obstacles confidently.

Research shows that high levels of career decision-making self-efficacy are positively associated with vocational identity (Gushue et al., 2006), career exploration behaviour (Yang & Chen, 2023), occupational self-efficacy (Taylor & Popma, 1990), positive attitudes toward career decision-making (Luzzo, 1993), and greater commitment to vocational preferences. Negative career-related thoughts associated with perfectionism or low self-concept can reduce career self-efficacy (Bullock-Yowell et al., 2011, 2012). Although most of the studies on career self-efficacy have focused on college students and adults, emerging research highlights its relevance for adolescents. According to Yiming et al. (2024), career decision-making self-efficacy is strongly associated with students' learning engagement, academic motivation, and overall performance. Using latent profile analysis, their study identified the following four subtypes of students based on their self-efficacy profiles: high self-efficacy, low self-efficacy, lack of internal exploration, and lack of external exploration. Notably, students with high self-efficacy demonstrated the most significant learning engagement and decision-making competence. The findings emphasize that building self-efficacy is not only fundamental for improving students' decision-making abilities but also instrumental in promoting intrinsic motivation and long-term educational outcomes.

To conclude, career self-efficacy is a central component of effective career development, especially in an increasingly unpredictable and competitive labour market. Skills training, guided instruction, and constructive feedback help a great deal in fostering self-efficacy, which in turn boosts the adolescents' preparedness to navigate career decision-making processes.

2.5. Need for Support in Career Decision-Making in Adolescence

Career decision-making gains importance during adolescence, yet many teens struggle with making school and vocational choices, often experiencing indecision, avoidance, or anxiety, especially around ages 14 to 15 (Gati et al., 2011; Marcionetti & Zammitti, 2023). Another challenge in today's world is marked by unprecedented and unpredictable changes which make decision-making much more difficult in a world that is already full of complexities (Marcionetti & Zammitti, 2023).

Parental support, particularly from mothers, has been shown to play a vital role in adolescents' career development (Colarossi, 2001; Whiston & Keller, 2004). Teachers and school staff also contribute significantly to the support network during this period. However, few studies have closely examined which sources of support adolescents find most influential, or how these perceptions might vary by gender or between parents and children (R. Cheung & Arnold, 2010).

Social support has become as a key component in analyzing adolescents' experiences with career indecision. Research shows that the lack of parental support can contribute to difficulties in making a career decision (Wolfe & Betz, 2004). Adolescents who per-

ceive higher levels of support from their families tend to report lower levels of career indecision (Nota et al., 2007), with career self-efficacy mediating the relationship between social support and decision-making outcomes (Jemini-Gashi et al., 2021; Lent et al., 2003). More recent studies explored how the perceived quality of family relationships impacts career decision-making self-efficacy. Research shows that positive family dynamics have an indirect influence on career decision-making self-efficacy through the development of adolescents positive decision-making skills (Park & Harris, 2024). Parental support, including providing information and encouragement, significantly influences the career exploration behaviours of adolescents (Liu et al., 2025), while career congruence between parents and adolescents, especially with mothers, has been associated with greater academic motivation and stronger career intentions (Fantinelli et al., 2023). Moreover, when adolescents feel supported they are more likely to develop the confidence needed to make informed and committed career decisions. These findings reinforce the idea that support systems are not only protective but also empowering in the career development process. Given the complexity of career indecision, understanding and addressing adolescents' support needs is essential for facilitating adaptive career choices (Jemini-Gashi et al., 2021).

3. Materials and Methods

3.1. Aims and Research Questions

Our study aims to elaborate and analyze the psychometric properties of a scale measuring career decisions in adolescents.

3.2. Participants

The sample consisted of 778 high school Romanian students (*Mage* = 16.65, *SD* = 1.31), consisting of male (*N* = 295), female (*n* = 467), non-binary (*n* = 2), and not-declared students (*n* = 14), covering the following three educational profiles: theoretical (humanities and sciences) (*n* = 417), vocational (theology, sport, and art and education) (*n* = 57), technological (technical, services, and natural resources and environmental protection) (*n* = 293), and not-declared (*n* = 11). The participants' grade-level distribution was as follows: 9th grade (*n* = 153), 10th grade (*n* = 168), 11th grade (*n* = 240), and 12th grade (*n* = 217).

3.3. Procedure

Participants were invited to join the study via emails sent to the school psychologists at each high school. The completion of the questionnaires was included in the career counselling activities implemented by the school psychologists. All students had the opportunity to participate voluntarily by accessing the survey invitation. Parents were informed about the career counselling activities and the completion of the questionnaire, and psychologists in each school obtained their consent. No incentives were offered for participation.

3.4. Measures and Scale Development Process

A factual questionnaire was used to collect data on the respondents' gender, age, grade level, and educational field.

Career decisions in high school students were measured through a 14-item questionnaire developed by the authors of this research. The items were assessed on a five-point Likert scale ranging from "not at all characteristic of me" to "extremely characteristic of me". A higher score indicates greater progress in the career decision-making process.

An initial pool of 35 items was generated based on a comprehensive review of relevant literature grounded in SCCT (Lent et al., 1994, 2000). The preliminary item pool was evaluated by a panel of three experts in educational psychology and adolescent career

counselling. Based on their feedback, 14 items were removed due to redundancy or limited theoretical relevance and their alignment with SCCT constructs (e.g., "I often think about having a job someday" was considered too vague and not specific to decision-making processes; "I thought about going to university" had a high overlap with the item "I informed myself about the possibilities that exist at the university and which suit me best"; "I usually wait for others to tell me what career path I should follow" was not aligned with SCCT). The remaining 21 items were pilot tested with a sample of 25 high school students to assess item clarity, language appropriateness, and interpretability. Based on student feedback, 4 items were revised and 7 were removed for ambiguity or misinterpretation (e.g., "I believe everything will work out fine in my career" and "I am good enough to succeed in my career" were considered too broad and ambiguous). The final set of 14 items was subjected to psychometric evaluation using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to assess the underlying factor structure and validate the scale (Tabachnick et al., 2018).

3.5. Data Analysis

Data collection was carried out between January and March 2024. To evaluate construct validity, exploratory and confirmatory factor analyses were performed. The initial sample was randomly divided into two subsamples: an exploratory sample (N = 388) and a confirmatory sample (N = 390). No significant differences were observed between the two groups with respect to gender [$\chi^2(4) = 5.942$, $p = 0.204$], educational profile [$\chi^2(2) = 0.123$, $p = 0.940$], or residential setting (urban vs. rural) [$\chi^2(2) = 1.640$, $p = 0.200$]. To investigate the underlying structure, exploratory factor analysis (EFA) was performed in IBM SPSS 23.0 using Promax rotation with Kaiser normalization, consistent with recommendations for analyzing correlated latent constructs (Costello & Osborne, 2005). The number of factors was determined based on eigenvalues greater than 1 (Kaiser criterion), inspection of the screen plot, and the interpretability of the factor solution (Tabachnick et al., 2018). Items with factor loadings of 0.40 or higher were retained, following standard guidelines in scale development research (Worthington & Whittaker, 2006). Confirmatory factor analysis (CFA) was subsequently conducted with IBM AMOS 23.0. The Kaiser–Meyer–Olkin (KMO) statistic (0.844) and the result of Bartlett's test of sphericity ($\chi^2 = 1581.494$, $p < 0.001$) demonstrated that the dataset was adequate for factor analytic procedures.

Parameters for the confirmatory factor analysis (CFA) were estimated using maximum likelihood (ML). Multivariate normality was supported by skewness and kurtosis values below 2.0. Mahalanobis distance analyses revealed no significant multivariate outliers; thus, all cases were retained for subsequent analyses. The evaluation of model fit relied on several indices, including chi-square (χ^2), the comparative fit index (CFI), the Tucker–Lewis index (TLI), the Akaike information criterion (AIC), and the root mean square error of approximation (RMSEA) (Wang & Wang, 2019). Analyses of factor loadings, item-level properties, and internal consistency were conducted to examine the robustness of the factor structure. To assess measurement invariance across genders, comparisons were made between the configural, metric, and scalar models. Evidence of invariance was determined based on non-significant chi-square differences at the $p < 0.01$ threshold (G. W. Cheung & Rensvold, 2002).

4. Results

4.1. Construct Validity

4.1.1. Exploratory Factor Analysis (EFA)

Evaluation of eigenvalues, Kaiser's criterion, and the screen plot suggested a two- to three-factor solution. While the three-factor model explained 54.10% of the total variance,

the third factor exhibited low Cronbach's alpha values, indicating that a two-factor solution was more appropriate. However, the two solutions would be tested through confirmatory factor analysis. The three factors were labelled as follows: F1, resources and exploration of options; F2, career choice self-efficacy; and F3, need for support in career decision-making.

The two-factor solution covered 46.058% of the total variance, with two items loaded on both factors (I need confirmation from my parents/teachers to ensure that I am making the right decision and I informed myself about the possibilities that exist at the university and which suit me best), suggesting that these items could be dropped (Table 1). The two retained factors were labelled F1, resources and exploration of options, and F2, career choice self-efficacy.

Table 1. Summary of factor loadings, reliability coefficients, and variance explained.

	Items	Three-Factor Solution			Two Factor-Solution	
		F1	F2	F3	F1	F2
C01	I was informed about my career options during high school. [Am fost informat despre opțiunile mele de carieră în timpul anilor de liceu.]	0.908			0.722	
C02	I had access to sufficient resources to develop a career plan during high school. [Am avut acces la resurse suficiente pentru a-mi forma un plan de carieră în timpul anilor de liceu].	0.898			0.633	
C05	I was encouraged to explore and develop my interests and skills during high school. [Am fost încurajat să explorez și să îmi dezvolt interesele și abilitățile în timpul anilor de liceu.]	0.680			0.681	
C06	I researched the job market regarding professions and employment opportunities after completing my studies. [Am prospectat piața muncii cu privire la lumea profesiilor și la posibilitățile de angajare după finalizarea studiilor.]	0.565			0.594	
C07	I informed myself about the possibilities that exist at the university and which suit me best. [M-am informat despre posibilitățile care există în mediul universitar și care mi se potrivesc cel mai bine.]	0.453	0.321		0.382	0.420
C12	I am confident that I can achieve my career goals. [Sunt sigur că îmi pot atinge obiectivele de carieră.]		0.893			0.634
C14	I am confident that the profession I want to pursue is a good fit for me. [Sunt sigur că profesia pe care vreau să o urmez mi se potrivește.]		0.793			0.718
C10	I know my strengths. [Îmi cunosc punctele forte.]		0.775			0.690
C13	I know my career options after finishing high school. [Îmi cunosc opțiunile de carieră după finalizarea liceului.]		0.635			0.642
C08	I need confirmation from my parents/teachers to ensure that I am making the right decision. [Am nevoie de confirmări din partea părinților/profesorilor pentru a mă asigura că iau decizia potrivită.]			0.708	0.482	−0.442
C03	I had meetings with the school counselor during high school. [Am avut întâlniri cu consilierul școlar în timpul liceului.]			0.601	0.722	

Table 1. *Cont.*

	Items	Three-Factor Solution			Two Factor-Solution	
		F1	F2	F3	F1	F2
C09	I am worried that my interests might change over time. [Sunt îngrijorat că interesele mele s-ar putea schimba în timp.]		−0.419	0.506	0.358	−0.690
C04	I completed psychological tests (recommended by a psychologist/counselor) during high school for self-awareness purposes. [Am completat, în timpul liceului, teste psihologice (recomandate de psiholog/consilier) în scopul autocunoașterii.]	0.354		0.467	0.694	
C11	No occupation strongly appeals to me. [Nicio ocupație nu mă atrage puternic.]			0.467		−0.601
	Cronbach's Alpha	0.780	0.800	0.528	0.785	0.745
	Number of items	5	4	5	7	7
	Eigenvalues	4.360	2.110	1.090	4.366	2.115
	Variance %	31.18	15.1	7.800	31.184	15.104

Note: rotation method: promax with Kaiser normalization.

4.1.2. Confirmatory Factor Analysis (CFA)

Following the EFA results, the questionnaire structure was further examined through CFA. The three-factor model with correlated errors demonstrated poor fit on several indices, with RMSEA values indicating misfit and lower-than-expected CFI values (Table 2). In line with the EFA findings and reliability analysis, the two-factor model exhibited a superior fit compared to the three-factor model. Adding correlations between errors terms of several items and eliminating the two problematic items led to a better fit of the model, therefore the two-factor model was confirmed. The factor loadings are reported int Table 3.

Table 2. Fit indices for competing measurement models.

Model	χ^2/df	CFI	TLI	AIC	RMSEA
M1—three-factor model uncorrelated errors	272.957/62 ***	0.850	0.811	14,279.229	0.098
M1—three-factor model correlated errors	173.411/58 ***	0.918	0.889	14,187.682	0.071
M2—two-factor model uncorrelated errors	314.481/75 ***	0.840	0.806	15,403.363	0.090
M2—two-factor model correlated errors	181.487/68 ***	0.924	0.898	15,284.369	0.065
M2—two-factor model correlated errors (items dropped)	117.781/48	0.946	0.925	12,999.432	0.061

Note: CFI, comparative fit index; TLI, Tucker–Lewis index; AIC, Akaike information criterion; and RMSEA, root mean square error of approximation. *** $p < 0.001$.

Table 3. Standardized factor loadings for the two-factor CFA model.

	Items	Loadings	
		F1	F2
C01	I was informed about my career options during high school.	0.466	
C02	I had access to sufficient resources to develop a career plan during high school.	0.432	
C05	I was encouraged to explore and develop my interests and skills during high school.	0.577	
C06	I researched the job market regarding professions and employment opportunities after completing my studies.	0.492	
C03	I had meetings with the school counsellor during high school.	0.373	
C04	I completed psychological tests (recommended by a psychologist/counsellor) during high school for self-awareness purposes.	0.533	

Table 3. *Cont.*

		Loadings	
	Items	**F1**	**F2**
C09	I am worried that my interests might change over time.		0.262
C10	I know my strengths.		−0.462
C11	No occupation strongly appeals to me.		0.352
C12	I am confident that I can achieve my career goals.		−0.465
C13	I know my career options after finishing high school.		−0.632
C14	I am confident that the profession I want to pursue is a good fit for me.		−0.652
	Cronbach's Alpha	0.771	0.775
	Number of items	6	6

4.2. Measurement Invariance by Student Gender

Measurement invariance by gender (male: 143; female: 247) was examined through a second-order CFA model, with detailed results shown in Table 4. The analysis supported only configural invariance as significant chi-square differences were found when comparing the configural, metric, and scalar models. This outcome suggests potential variability in factor loadings across gender groups. Nonetheless, caution is warranted in interpreting these findings due to the comparatively smaller representation of male participants within the sample.

Table 4. Measurement invariance across gender.

	Model Fit			**Baseline Test**			**Difference Test**		
	AIC	**BIC**	***n***	**χ^2**	**df**	***p***	**$\Delta\chi^2$**	**Δdf**	***p***
Configural invariance	12,932.770	13,225.694	390	271.199	106	<0.001			
Metric invariance	12,935.862	13,189.201	390	294.291	116	<0.001	23.092	10	0.010
Scalar invariance	12,936.247	13,142.085	390	318.676	128	<0.001	24.385	12	0.018

The correlation between the two factors was weak at 0.283 but statically significant ($p < 0.001$), while each of the two factors correlated significantly with the overall score: 0.814 ($p < 0.001$) for the resources and exploration of options dimension and 0.788 ($p < 0.001$) for the career choice self-efficacy dimension.

There are no gender differences regarding the overall score (M_{male} = 26.396, SD = 6.984, M_{female} = 25.623, SD = 7.377, t_{760} = 1.439, and p = 0.151) and the two dimensions, resources and exploration of options (M_{male} = 15.827, SD = 4.160, M_{female} = 15.353, SD = 4.547, t_{760} = 1.447, and p = 0.148) and career choice self-efficacy M_{male} = 10.569, SD = 4.730, M_{female} = 10.269, SD = 4.607, t_{760} = 0.865, and p = 0.387). For the educational profile, there were significant differences for the total score and for the resources and exploration of options dimensions (Table 5). For the total score, there was only one significant difference between students from the technological profile and the theoretical profile (t = 2.744, p_{Tukey} = 0.017). For the resources and exploration of options dimension, there were differences between students from the technological profile and the theoretical profile (t = 4.366, $p_{Tukey} < 0.001$), with students enrolled in the technological profile declaring that they benefited from resources and exploration of career options more than the other students.

Table 5. Differences between educational profiles for career decision dimensions.

Dimensions	Profile	*n*	*M*	*SD*	*F*	*p*	Eta Squared
Total	Technological	293	26.73	6.991	3.878	0.021	0.007
	Theoretical	417	25.218	7.343			
	Vocational	57	26.316	7.588			
Career choice self-efficacy	Technological	293	15.423	4.324	1.415	0.244	0.001
	Theoretical	417	15.453	4.464			
	Vocational	57	16.456	4.175			
Resources and exploration of options	Technological	293	11.307	4.661	9.894	<0.001	0.023
	Theoretical	417	9.765	4.629			
	Vocational	57	9.860	4.522			

For the educational profile, there were significant differences for the total score and for the resources and exploration of options dimensions (Table 6). For the total score, there were significant differences between 9th grade and 11th (t = 5.924, p_{Tukey} < 0.001) and 12th grade students (t = 0.4.683, p_{Tukey} < 0.001). For the resources and exploration of options dimension, there were differences between 9th grade and 11th (t = 6.268, p_{Tukey} < 0.001) and 12th grade students (t = 4.633, p_{Tukey} < 0.001), and between 10th grade and 11th grade students (t = 3.555, p_{Tukey} = 0.002). For the career choice self-efficacy, there was only one significant difference between 9th grade and 11th grade students (t = 2.936, p_{Tukey} = 0.021). The results showed that older students have higher access to career resources and information and also higher levels of career self-efficacy.

Table 6. Differences between grade level for career decision dimensions.

Dimensions	Grade	*n*	*M*	*SD*	*F*	*p*	Eta Squared
Total	9th	153	2.142	0.576	11.567	<0.001	0.043
	10th	168	2.277	0.511			
	11th	240	2.452	0.581			
	12th	217	2.422	0.585			
Career choice self-efficacy	9th	153	1.419	0.773	14.338	<0.001	0.053
	10th	168	1.641	0.678			
	11th	240	1.913	0.793			
	12th	217	1.792		0.779		
Resources and exploration of options	9th	153	2.937	0.648	3.486	0.015	0.013
	10th	168	2.978	0.558			
	11th	240	3.055	0.639			
	12th	217	3.132	0.662			

5. Discussion and Conclusions

The purpose of this paper was to present a new instrument aiming to measure career decisions aspects in high school students and to analyze its psychometric properties, specifically the construct validity and the reliability of the scale. The findings support a two-factor structure encompassing resources and exploration of options and career choice self-efficacy, offering theoretical clarity and empirical support for a concise and practical tool (Nauta, 2024).

5.1. Construct Validity, Factor Structure and Reliability

Exploratory factor analysis (EFA) initially suggested a potential three-factor solution. However, due to the poor reliability of the third factor (need for support), the two-factor solution was deemed more appropriate and theoretically coherent. Items that loaded ambiguously or weakly were removed, leading to improvements in both internal consistency and model fit. Confirmatory factor analysis (CFA) further supported the superiority of the

two-factor model, particularly after the removal of two problematic items and the correlation of selected error terms. The final model demonstrated good fit indices, supporting the structural validity of the scale.

The two retained dimensions reflect theoretically grounded constructs. Resources and exploration of options captures students' perceptions of their access to information, guidance, and self-assessment tools, aligning with contextual and experiential components of career development. Career choice self-efficacy taps into the internal confidence and perceived competence to make career-related decisions, resonating with Bandura's (1997) concept of self-efficacy (Bandura, 1997) and its application in Social Cognitive Career Theory (Lent et al., 2000).

The relatively weak correlation observed between resources and exploration of options and career choice self-efficacy in the present study is both statistically and theoretically justifiable. Previous research has shown that self-exploration and environmental exploration are conceptually similar to the two factors identified here; self-exploration has been linked more strongly to constructs such as general self-efficacy, whereas environmental exploration is more predictive of perceived access to career information and job search behaviours (R. Cheung & Arnold, 2014; Nauta, 2024). While both are integral to career development, treating them as a single construct can obscure important nuances (Jiang et al., 2019).

These findings align with the current results, reinforcing the decision to model resources and exploration and career choice self-efficacy as distinct but related dimensions of adolescents' career decision-making process. Both subscales demonstrated acceptable reliability. While the correlation between the two factors was statistically significant, it was relatively weak, suggesting they represent related but distinct aspects of career decision-making. Their strong correlation with the overall scale score further supports their conceptual and empirical relevance within a unified framework.

5.2. Measurement Invariance and Group Differences

Tests of measurement invariance indicated that configural invariance was met across gender groups. However, metric and scalar invariance were not fully supported, suggesting that the strength of the relationships between items and underlying factors and the meaning of the scale scores may differ slightly between genders. This limits the validity of direct comparisons of latent means across male and female students and indicates that observed similarities or differences in scores should be interpreted with caution.

This lack of full invariance may be partially attributed to the smaller male subsample, which could have reduced statistical power. Nevertheless, the absence of significant gender differences in observed mean scores for both subscales and the overall scale is consistent with research suggesting that while career interests and occupational aspirations may show gender differences, the cognitive and contextual resources underpinning career decision-making tend to be more stable across genders. (Inda et al., 2013; Lent et al., 2000).

However, these conclusions should be interpreted cautiously, given the fact that there are also previous studies showing that girls and women often report lower career-related self-efficacy in male-dominated fields due to social discouragement, lack of role models, and gender-stereotyped socialization. Prior research grounded in Social Cognitive Theory has consistently demonstrated that even subtle gendered differences in socialization, environmental feedback, and role modelling can significantly shape students' career-related beliefs and decisions (Mozahem, 2022). For example, agent-based modelling has shown that relatively minor forms of discouragement in the environment can lead to a pronounced underrepresentation of females in STEM fields, not due to lack of ability but through reduced self-efficacy and exposure to supportive experiences. These findings suggest that while quantitative differences may not be apparent in general assessments, underlying

structural or cultural influences could still affect how male and female students experience and interpret career preparation. Thus, the absence of observed gender differences in this study does not necessarily imply equal career development contexts, and future research should continue to examine the nuanced interplay between gender, support systems, and career self-concept. Future studies should aim to achieve a stronger gender balance and consider conducting item-level analyses or gender-specific calibrations to refine the scale's sensitivity and ensure its validity across diverse student populations.

In our study, students enrolled in technological tracks reported significantly higher access to resources and opportunities for career exploration compared to their peers in theoretical and vocational tracks. This finding aligns with existing literature highlighting the advantages of technological education pathways in equipping students with practical skills and industry-relevant experiences (Kreisman & Stange, 2020; Peñate et al., 2024). These differences may reflect curriculum structure or a greater emphasis on applied career decision-making embedded within technological programmes. As such, the results underscore the scale's sensitivity to educational context and support its utility in comparative studies and needs assessments. Factors such as sample size limitations, cultural influences, or unmeasured variables may have influenced the absence of gender effects.

Age differences were also observed, indicating that older students demonstrated higher levels of career decision-making readiness and clarity compared to their younger peers. As students progress through high school and gain more exposure to academic, social, and vocational experiences, they develop a clearer understanding of their career goals and options. These findings align with theories which propose that career maturity and decision-making competencies improve with age and educational stage (Super, 1980). Therefore, grade level and age should be considered important contextual factors when designing career guidance interventions.

5.3. Theoretical Implications

The development of a scale assessing resources, exploration of options, and career choice self-efficacy advances the theoretical understanding of career development during adolescence. By integrating concepts from SCCT (Lent et al., 2000) and developmental models of vocational identity, the scale allows for a nuanced exploration of how cognitive, contextual, and motivational variables shape career decision-making during a formative period. It supports the conceptual distinction between external factors (e.g., access to information, support systems) and internal resources (e.g., confidence in one's ability to make choices), offering a dual-factor model that can be used to test hypotheses about how adolescents navigate complex career pathways.

Furthermore, the scale can inform longitudinal research by tracking developmental changes in career-related attitudes and behaviours over time, within the framework of the career self-management model proposed by Lent and Brown (2013). Using this scale at multiple time points would allow researchers to trace developmental shifts in students' career decision-making processes, including changes in confidence, goal clarity, and exploration behaviours, to analyze the interaction between self-efficacy beliefs, goals setting, and self-regulatory behaviours and contextual factors. Longitudinal studies can highlight how students' career readiness evolves across high school years and help to evaluate the effectiveness of career interventions delivered at different developmental stages, enhancing both theoretical understanding and practical applications in school-based career guidance.

5.4. Practical Implications

From a practical perspective, this scale offers a valuable and context-specific tool for school counsellors, educators, and career guidance professionals working with high

school students. Unlike broader career self-efficacy instruments, this scale was specifically developed to reflect the educational structure and developmental challenges of secondary school students. It captures key aspects of decision-making relevant to this age group, making it uniquely suited for school-based use. Its brevity makes it easy to administer in educational settings, while its two-factor structure provides actionable insights. The resources and exploration of options dimension enables practitioners to identify students who may lack access to career-related information, structured exploration opportunities, or adult guidance. Low scores in this area can guide the implementation of career activities, mentorship programmes, or classroom-based exploration activities. This dimension also helps to prioritize support for students with limited access to resources, contributing to a more equitable delivery of career education. There is also a dimension which describes learners that feel uncertain or lack confidence in making career decisions. Counsellors could formulate specific strategies like small group workshops for enhanced decision-making, self-confidence training, and goals' attainment. These activities can be tailored by grade level to match students' cognitive and emotional readiness for planning their futures. Using this scale allows practitioners to more effectively help students build the confidence and guidance needed for thoughtful academic and career planning.

5.5. Limitations and Future Research Directions

Despite the contributions of the present study, several limitations should be noted. First, the data were cross-sectional, leaving the scale's temporal stability unexamined. This limitation will be addressed in future research through a second wave of data collection. Second, all measures relied on self-report, which may introduce social desirability and recall biases. Future studies should seek to validate the scale against more objective indicators of career behaviour and academic performance, such as counsellor evaluations or school records. Third, while this study examined the measurement invariance across gender, it is possible that career decisions also vary by age and field of study. However, our sample is unbalanced in terms of educational tracks, with a relatively small number of students enrolled in vocational profiles. This may have limited the generalizability of the findings and the ability to explore potential differences in career decision-making across educational pathways. To address this in future research, we recommend the use of stratified sampling strategies to ensure a more balanced representation of students from theoretical, technological, and vocational tracks. This approach would allow more robust cross-group comparisons and help validate the scale's applicability across different educational contexts. Additionally, broader sampling would allow for the investigation of how contextual factors tied to each educational track influence the development of career-related attitudes and self-efficacy.

Furthermore, although configural invariance was supported, the lack of metric and scalar invariance suggests that the structure or meaning of the career decision-making construct may differ between gender groups. The smaller number of male participants may have influenced these results. Future studies should aim for a more gender-balanced sample and broader representation across educational profiles to reassess the instrument's measurement equivalence.

Additionally, while the scale demonstrated sensitivity to educational context, its applicability across different cultural or institutional settings has yet to be examined. Cross-cultural validation would help clarify the universality of the constructs and ensure their broader utility. Beyond cultural validation, future research should also explore the longitudinal predictive validity of the scale by examining how scores relate to subsequent academic achievement, persistence, or post-secondary career outcomes. Establishing predictive associations would strengthen the practical utility of the scale in identifying students who may

benefit from early guidance and in evaluating the long-term effectiveness of career interventions. Tracking career-related outcomes over time, such as educational attainment, job placement, or satisfaction, would strengthen the evidence for the scale's practical relevance, as previous studies suggest (Ebner & Paul, 2023). Integrating longitudinal methods and mixed data sources would allow for a more comprehensive understanding of how early career decision-making translates into long-term success.

A key limitation of this study is that the sample consisted only of Romanian high school students, which may pose a problem for the external validity of the results in relation to other cultures or educational systems. Career decision-making is shaped by the underlying value systems, cultural frameworks, expectations, and support systems. In this instance, the constructs measured by the scale, such as self-efficacy and access to resources, may function differently across countries or cultural groups. Therefore, future research should aim to replicate and validate the scale in diverse cultural settings, using cross-national samples to examine the cultural equivalence of the factor structure and item interpretations.

Overall, this scale provides a practical and theoretically grounded tool for evaluating adolescents' career readiness, with applications in research, school counselling, and policy development. Future research should further examine its cross-cultural validity, longitudinal predictive power, and utility across diverse educational systems, while also continuing to explore contextual and gender-related influences on career decision-making.

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Abbreviations

The following abbreviations are used in this manuscript:

SCCT	Social Cognitive Career Theory
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
TLI	Tucker–Lewis Index
AIC	Akaike Information Criterion
RMSEA	Root Mean Square Error of Approximation

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