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The Influence of College Students' Core Self-evaluation on Job Search Outcomes: Chain Mediating Effect of Career Exploration and Career Adaptability

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Abstract
The study of college students' job search and influencing factors has been an important topic in college students' career development. The degree of satisfaction with the results of a college student's perceived job search directly affects the sustainability of his or her future career. Although the importance of core self-evaluation in the job search process has been confirmed by a large body of literature, very little literature has focused on the mechanism of action between core self-evaluation and job search outcomes. Therefore, this study was conducted to analyze the impact of core self-evaluation on job search outcomes through a chain mediation model and to discuss the role of career exploration and career adaptability in this relationship. Two waves of survey data were utilized to test the research hypotheses on a sample of 310 college students facing employment in different regions of China. The results indicated that core self-evaluation positively impacted job search outcomes. In addition, career exploration and career adaptability moderated the relationship between core self-evaluation and job search outcomes, respectively. More importantly, core self-evaluation could also influence job search outcomes through the chain-mediating effects of career exploration and career adaptability.

Keywords Core self-evaluation · Job search outcomes · Career exploration · Career adaptability · College students' employment

Introduction

The employment problem of college students has been receiving attention from scholars all over the world in recent years (Chowdhury & Miah, 2019; Clausen & Andersson, 2018; Lewis, 2019). Coupled with the impact of the COVID-19, a large number of industries have been hit leading to frequent layoffs and unemployment situations in China, which has increased the employment pressure of college students (Hensher, 2020; Kawohl & Nordt, 2020). In addition, the harmony and stability of society cannot be achieved without the active help of successful employment of college students, and the healthy development of college students needs to rely on their successful employment. Job search outcomes (JSO) are related to the individual's comprehensive quality and ability, is a job search end of the final state. This state is a good result for individuals to complete the role change in their career and become a workplace person. Researchers believe that the JSO is a reflection of the individual's efforts in the job search, and is the result of his or her experience in a series of job search processes. Other researchers have studied the JSO of college students, and believe that their JSO is the result of a series of job search behaviors taken by college students in the job search process. However, under the unpromising macro situation, college students are facing an awkward situation in their job search. The job search process is full of complaints, which has become more serious in recent years, and researchers

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are becoming aware of the urgent need to study the JSO of college students who are starting in the job market.

Core self-evaluation (CSE), as one of the important indicators of personality traits, has been gradually gaining attention in recent years and is considered one of the important predictors of JSO (Crawford, 2018; Smedema et al., 2021; Wang et al., 2021). CSE refers to the most basic evaluation that an individual holds of his or her abilities and values, which is a relatively persistent and basic evaluation of oneself as an individual (Erez & Judge, 2001; Judge et al., 2005). Researchers have conducted numerous studies and confirmed that CSE has a positive impact on many factors of the job search process, such as self-set goals (Itzchakov & Latham, 2020), job autonomy (Joo et al., 2010), life satisfaction (Gurbuz et al., 2021; Smedema et al., 2021), career decision difficulties (Shen et al., 2021), job performance (Ahn et al., 2018; O'Neill et al., 2016), etc.

However, research on JSO is not yet mature and well developed, let alone how CSE influences JSO (Ningrum et al., 2020). The currently recognized factors that influence JSO are attributed to individual factors, labor market, and resources (Xie & Lu, 2016). Among these factors, individual factors refer to personality traits (Van den Hee et al., 2020), individual abilities (Naderiadib Alpler et al., 2021), etc. Labor market factors include current employment policies and the supply and demand in the job market (Hulshof et al., 2020; Shahiri & Osman, 2014). The resource factor includes the individual's human capital, social resources, and career psychological resources (Ayoobzadeh, 2021; Beggs & Hurlbert, 1997; Dalla Rosa et al., 2020; Ślebarska et al., 2009). The current studies focus more on the influence of individual or resource factors on JSO and do not consider their joint or even interactive effects (Guan et al., 2014). Moreover, researchers do not agree on how to define and measure JSO, and focus more on whether job seekers have completed their employment or not, while few studies have addressed the subjective evaluation of job seekers' employment quality and satisfaction (Mau & Kopischke, 2001; Xiong et al., 2017). Because of this, this study is innovative in determining JSO in terms of the sum of the objective number of interviews and job offers and employment satisfaction of job seekers. Besides, while exploring the relationship between personal traits CSE and JSO, adding individual and resource factors for linkage influence mechanism analysis can enrich the content and research breadth of existing studies. Labor market factors are not included in the statistics because their policy and supply and demand issues change more rapidly and are difficult to assess directly using a quantitative approach.

Research Theory and Hypothesis

In the rapidly changing and uncertain knowledge economy, the traditional career model dominated by organizations or society has been greatly impacted, and the self-concept of individual career development is being strengthened. Savickas (2002) proposed Career Construction Theory (CCT), which stated that due to the uncertainty in the construction of college students in their career environment, college students' career development needs to be developed and managed by themselves (Rudolph et al., 2019; Savickas et al., 2009). The CCT model with "adaptation" as the core provides new themes and ideas for career development research from a postmodern perspective, in which individual characteristics, individual behaviors, individual psychological states, and situational factors are all important aspects that affect the results of career construction. When college students are looking for a job near graduation, the first thing they need to solve is to find a workplace that can accept them, i.e., whether they get a job or not, which is a key threshold issue to enter the labor market. The degree of satisfaction with the job or whether the JSO meets their expectations is the focus of the CCT. The best expression of career results is the match between self and environment, in order to improve this match requires college students to put in more effort in the early stage to support a more optimal result. In other words, the JSO is actually a result of career construction performance. Specifically, Fig. 1 below shows.

As can be seen from Fig. 1, firstly, CCT considers individual motivation as the antecedent variable of the entire career construct. Individual motivation is the premise that individuals "actively" construct and understand their individual experiences and form their intrinsic reality and future outcomes, including abilities, interests, needs, values, and personality traits. From the previous introduction, it is clear that CSE, as the most basic evaluation an individual holds of his or her abilities and values, is a relatively durable and basic evaluation of oneself as an individual. CSE consists of four main personality traits: self-esteem, generalized self-efficacy, emotional stability, and

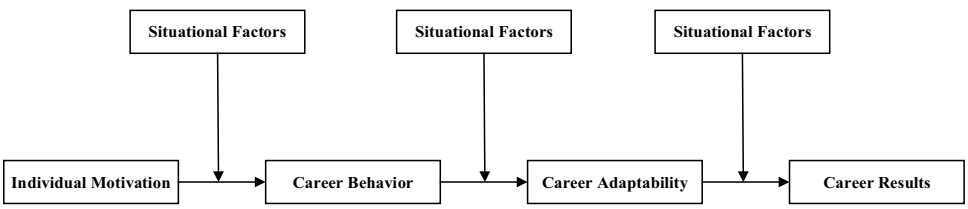

Fig. 1 CCT Model

locus of control (Ding & Lin, 2020; Judge et al., 1998). High CSE is characterized by self-confidence, a high sense of self-worth, perception of competence, freedom from anxiety, and always having a positive opinion of oneself in a variety of situations (Judge et al., 2009). Initially, CSE was measured by assessing each of these four traits separately and adding them together (Judge, 2009). To address this cumbersome process and obtain a more concise and valid scale, Judge et al. (2003) developed a new 12-item CSE scale (Judge et al., 2003). Subsequent researchers have conducted numerous studies based on this scale and have confirmed that CSE has a positive impact on many factors of the job search process, such as goal setting, job passion, life satisfaction, career decision difficulties, and job performance. However, few studies have directly confirmed the direct relationship between CSE and JSO, especially for the college student population. Therefore, this study proposes the following research hypothesis based on this.

Hypothesis 1: Core Self-Evaluation is positively related to Job Search Outcomes.

Secondly, CCT points out that after having individual motivation, individuals will continue to explore themselves and their environment in order to hone the fit between self and society, which is the main reason for career behavior. Career exploration (CE), as the main measure of self-exploration and environmental exploration, is considered as a general exploration activity that not only helps individuals to gather information related to their career development but also helps individuals to solve problems on the CE path to facilitate better career choices (Chen, Chen, et al., 2021; Chen, Liu, et al., 2021; Gross-Spector & Cinamon, 2018; Zhou & Xu, 2021). CE has been shown to play a significant mediating role in the effects of CSE, and individuals with high CSE are more likely to actively engage in exploratory behavior, which means that high CSE predicts high CE (Liu & Zhang, 2017). Better CE is more likely to exhibit more positive behaviors, such as career planning (Phillips & Blustein, 1994; Super & Hall, 1978). Given that a good career plan is an important determinant of future JSO, it is feasible to hypothesize that CSE has a positive effect on CE, and CE has a positive effect on JSO (Tomy & Pardede, 2019). Also, prior research showed that CE is an important expression of personal initiative which supports the positive effect of CE on JSO, cause a good JSO is based on a certain level of exploration activities and excellent planning (Zikic & Klehe, 2006). Based on the mediating effect of CE on CSE and the positive effect on JSO, it is reasonable to propose the hypothesis that CE has a mediating effect on JSO.

Hypothesis 2: Career Exploration is significantly mediate the relationship between Core Self-Evaluation and Job Search Outcomes.

Thirdly, The main logic of CCT shows that career adaptability is the third main element. Career adaptability (CA) is the ability of an individual to adapt to and maintain balance with changes in career roles (Chen et al., 2020; Haenggli & Hirschi, 2020). CA should contain three typical characteristics: an ability to help the individual "move forward"; an ability that can be developed; and the result of interaction between the individual and the environment (Bocciardi et al., 2017). Although studies have examined the relationship between CSE and CA, they have not directly examined the mechanisms of interaction with other factors, and the effect of CSE on CA is determined by differences in individual motivation and resources throughout an individual's career (Zacher, 2014). Specifically, individuals with high CSE have a higher sensitivity to future career planning and workplace information, which leads to stronger internal motivation to promote CE and other behaviors, and better adapt to the changing labor market. In other words, when individuals actively engage in CE, then their understanding of themselves and their environment is enhanced while also having a positive effect on their ability to adapt better. In contrast, individuals with lower CSE may exhibit negative behaviors such as fear and avoidance, which in turn may lead to lower levels of CA (Chang et al., 2012). Further, the relationship between CA and JSO has been shown to have a strong association (Kaur & Kaur, 2021; Kundi et al., 2021), which can be explained by the extension and calibration of CCT described above. Therefore, based on this thesis this study proposes the following research hypothesis.

Hypothesis 3: Career Exploration is positively related to Career Adaptability.

Hypothesis 4: Career Adaptability is significantly mediate the relationship between Core Self-Evaluation and Job Search Outcomes.

Finally, according to this theory, this study considers that the main experience in the process of an individual's career development is: the individual's subjective willingness or readiness to adapt, relying on the psychosocial resources that help self-adjustment, and acting through specific stress reactions or career behavior choices, and finally achieving the relative adaptation result of the interaction and integration between the

individual and the environment. In this process, JSO, as the result of college students completing their studies, successfully seeking employment, and ending their college career, can be included in the theory as the result of good adaptation. CSE, career exploration (CE), and career adaptability (CA) may also be important influencing factors of adaptation outcomes. According to the theory, CSE can be considered as an individual's personality trait (Farčić et al., 2020), an internal motivation for individual adaptation that helps individuals to actively participate in CE activities (Blustein, 1988; Lazarides et al., 2015), which in turn helps individuals to develop readiness and resources for mutual adaptation of self and the external world to achieve this adaptation outcome (Gu et al., 2020; Monteiro et al., 2019). This implies that CE and CA, as two important individual and resource factors, may play a crucial mediating role in the relationship between core self-evaluation and JSO. Therefore, based on this thesis this study proposes the following research hypothesis.

Hypothesis 5: Career Exploration and Career Adaptability play the role of chain intermediary in the relationship between Core Self-Evaluation and Job Search Outcomes. The hypothetical model is shown in Fig. 2.

However, the above influences and mechanisms of action of CSE, CE, and CA on JSO are at a conjectural and hypothetical stage, lacking corresponding systematic sorting and research. Therefore, this study aims to explore the influence of CSE, CE, and CA on JSO of college graduates and their mechanisms of action based on CCT in combination with previous studies, hoping to explore the reasons affecting their JSO in-depth, to inspire them to increase their effective job-seeking behaviors and cognition and increase their chances of successful employment.

Method

Participants

Firstly, since the research subjects in this study were university seniors on the verge of graduation, a convenience sample approach was used to recruit participants from an online recruitment platform in China to ensure that all participants met the requirements of the study. The inclusion criteria for participants were senior college students who had participated in an interview. Secondly, all participants were informed of the purpose of the study after recruitment and could opt-out of participation in the study at any time if they did not agree to the use of the data. Thirdly, to ensure that the recruited sample was representative, the sample was given equal opportunity to participate in the recruitment process without any deliberate bias, and demographic variables were included in this study to analyze the distribution of the sample to avoid bias. Fourthly, because this study used cross-sectional data analysis, the authors contacted university graduates from different regions for data collection at two-time points to avoid common method bias in the study data. In the first stage, an online questionnaire on demographic variables, CSE and JSO was distributed to the participants through an online questionnaire with the promise that all information would be kept strictly confidential after obtaining their approval. A total of 423 valid data were collected for this study during this phase. Two weeks later 423 were asked to complete the online questionnaire concerning CE and CA, and a total of 310 valid data were collected. Of the 310 participants, 187 were male (60.32%) and 123 were female (39.68%).

Measures

Core Self-Evaluation

The " Core Self-Evaluation " scale by Judge et al. was used to measure 12 items (Judge et al., 2003). Items were scored

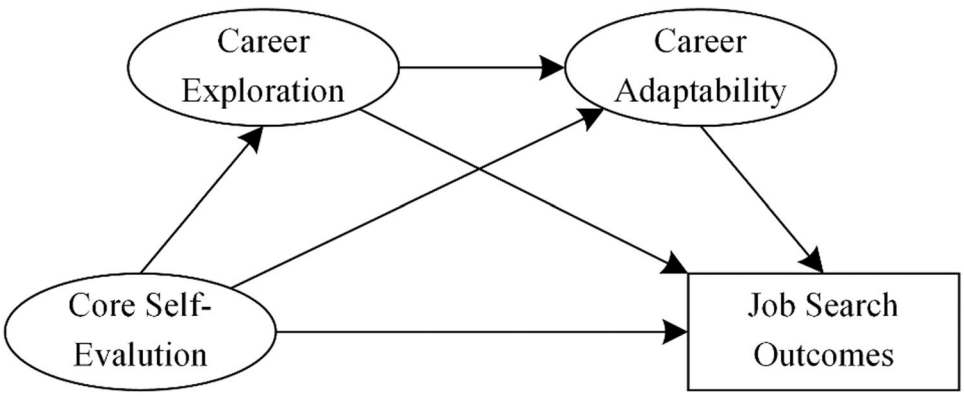

Fig. 2 Hypothesis model

on a 5-point Likert scale. The higher the total score, the higher the CSE. According to the item packaging strategy, since the CSE has only one dimensional and a larger number of items, in order to ensure sufficient reliability in the mediating role analysis, so core self-evaluation unidimensional scale was packaged using a factorial approach to obtain two indicators (CSE A and CSE B) of the scale (Igolkina & Meshcheryakov, 2020). The internal consistency reliability of the CSE scale was 0.77. For details, refer to Table 4 in the Appendix.

Job Search Outcomes

The "Job Search Outcomes" scale by Xie et al. was used to measure 3 items, including job satisfaction and the number of offers (Xie & Lu, 2016). The items were rated on a 5-point Likert scale. The internal consistency reliability of the JSO scale was 0.91. For details, refer to Table 5 in the Appendix.

Career Exploration

The "Career Exploration" scale, revised by Chen et al. based on Stumpf's "Career Exploration Survey" (Stumpf et al., 1983; H. Chen, Liu, et al., 2021; Chen, Chen, et al., 2021), was used to measure 18 items, including environmental exploration, self-exploration, purpose-system exploration, and amount of information. Items were scored on a 5-point Likert scale. The internal consistency reliability of the CE scale was 0.89. For details, refer to Table 6 in the Appendix.

Career Adaptability

The "Career Adaptability" scale revised by Hou et al. was used to measure 24 items, including career concern, career confidence, career curiosity, and career control (Hou et al., 2012). The items were scored on a 5-point Likert scale. The internal consistency reliability of the CA scale was 0.92. For details, refer to Table 7 in the Appendix.

Control variables

Previous studies have found that, on the one hand, gender factors cause significantly different outcomes in the current job market, and that women experience widespread problems of discrimination in the employment process. Thus, this study controlled for the gender variable of the participants, with gender coded as male = 1 and female = 2, in order to capture the differences due to gender issues in the subsequent analysis. On the other hand, due to the current state of economic development in China, there is a significant development gap due to geographical differences. Therefore, this study also controlled for the region of the participants, which was coded as eastern region (economically developed) = 1, central region (average) = 2, and western region (economically backward) = 3. The inclusion of region as a control variable was also intended to capture the differences due to this variable in the subsequent analysis.

Data analysis

To test the research hypotheses of this study, the following process was conducted. Firstly, Since the instruments used were well-established scales and their use in Chinese was proven to be usable, no additional analysis of the predictions was required for this study. Secondly, the validity of CSE, CE, CA, and JSO was assessed by using reliability tests and validated factor analysis in SPSS 25.0 and Amos 21.0. Thirdly, the factors were included as latent variables in structural equation modeling analysis to test for common method bias. Fourthly, the research hypotheses were tested by relative analysis. Finally, the hypothesized models were tested for validity by Amos 21.0, which was chosen for the analysis because it provides high-quality path analysis diagrams to help researchers visualize the relationships and effects of the variables, and the mathematical method used by Amos is also one of the most effective and reliable methods. In addition, the hypothesized model was tested for the significance of mediating effects by the Bootstrap method (5000 replicate draws).

Results

Common method deviation test

In this study, the variables were studied using an online questionnaire, and self-reporting may introduce the problem of common method bias (Kock et al., 2021). Therefore, referring to the suggestion of previous research (Podsakoff et al., 2003), we tested for common method bias using two time periods of data collection and to control for non-measurable latent factors, respectively. This was done by

Table 1 Results of validation factor analysis

Models	RMSEA	SRMR	IFI	GFI
Five-factor model	0.05	0.04	0.95	0.98
Four-factor model	0.06	0.05	0.93	0.96
Three-factor model	0.08	0.08	0.87	0.85
Two-factor model	0.12	0.10	0.68	0.73
One-factor model	0.18	0.12	0.57	0.69

including the common method bias factor as a latent variable in the structural equation model and allowing all measurement items to have loadings on this factor. The absence of severe common method bias is indicated if the fit indices of the post-control model are not better than the pre-control ones (Siemsen et al., 2010). As can be seen from Table. 1, where the changes in the fit indices are: △RMSEA = 0.01, △SRMR = 0.01, △IFI = 0.02, and △GFI = 0.02. The changes in each of the fit indices are less than 0.03, which indicates that the model is not significantly improved by the inclusion of the common method factor, indicating that there is no serious common method bias problem in the measurements (Baumgartner et al., 2021).

Descriptive statistics

Descriptive statistics for each variable are shown in Table. 2 below, where gender is scored on a 2-point scale, region is scored on a 3-point scale, and the remaining variables are scored using a 5-point scale, so 3 is used as the theoretical median. The overall CSE of college students was moderately high (M = 3.24, SD = 0.93), and the mean value of each sub-dimension was higher than the critical value. The overall CE of college students was moderately high (M = 3.56, SD = 1.02), and all dimensions were above the theoretical median, with the highest mean value of self-exploration water (M = 4.03) and the lower mean score of information quantity (M = 3.22). This shows that the sample received relatively less amount of information in CE compared to other dimensions. The overall CA of college students was moderately high (M = 3.35, SD = 0.89), and all dimensions were above the theoretical median, with the highest mean water score (M = 3.79) and lower mean score (M = 3.23) for career concern in the career confidence dimension. Finally, the data results of JSO of college students showed that the sample was lower than the theoretical median value, which was 2.84. This shows that the college students were not very satisfied with their JSO.

In addition, in terms of correlation analysis. CSE showed a positive correlation with CE, CA, and JSO ($p < 0.01$). CE also showed a positive correlation with CA and JSO ($p < 0.01$). CA and JSO also showed a positive correlation ($p < 0.01$). Also, this study found that gender was not correlated with other variables, while CSE and CE produced significant correlations in terms of region.

Chain intermediary role

Firstly, the model analysis of the direct predictive effect of CSE on JSO in this study revealed that the fit indices of the model were $X^2/df = 3.35$, RMSEA = 0.06, GFI = 0.98, CFI = 0.97, and TLI = 0.98, which indicated that the model was a good fit. CSE was able to predict JSO significantly and positively ($\beta = 0.12$, $p < 0.01$), with an explanatory $R^2 = 12\%$ for JSO, which indicated research hypothesis 1 was confirmed.

Secondly, the study added CE and CA as mediating variables to construct a chain mediation model and found that the fit indices of the model were $X^2/df = 2.35$, RMSEA = 0.05, GFI = 0.99, CFI = 0.98, TLI = 0.99, which indicated that the model fit was good (Williams et al., 1989). Among them, the direct predictive effect of CSE on JSO was not significant ($\beta = 0.12$, $p < 0.01$). The direct predictive effect of CSE on CE was significant ($\beta = 0.12$, $p < 0.01$). The direct predictive effect of CSE on CA was significant ($\beta = 0.12$, $p < 0.01$). The direct predictive effect of CE on CA was significant ($\beta = 0.12$, $p < 0.01$), which indicated research hypothesis 3 was confirmed. The predictive effect of CE on JSO was significant ($\beta = 0.12$, $p < 0.01$). The predictive effect of CA on JSO was not significant ($\beta = 0.12$, $p > 0.05$). Compared to the direct predictive role model, the chain mediated effects model was able to improve the explanation of employment satisfaction ($\Delta R^2 = 6\%$). The above results indicated that CE mediated the effect of core self-evaluation on JSO, and CE and CA mediated the chain effect in the relationship between CSE and JSO.

Immediately after, this study further tested the significance of the mediating effect using the Bootstrap method (5000 repetitions) and found that the standardized effect value of CE in mediating the effect between CSE and JSO (path 1) was 0.08, 95% confidence interval (0.05, 0.21), and the results did not include 0. This concluded that research hypothesis 2 has to be confirmed and that CE plays a partially mediating role between CSE and JSO.

Table 2 Means, standard deviations, and correlations

Variable	M	SD	1	2	3	4	5
1. Gender	1.40	0.49	-				
2. Region	1.92	0.82	-0.04	-			
3. CSE	3.24	0.93	0.34	-0.14*	-		
4. CE	3.56	1.02	0.54	-0.21*	0.72**	-	
5. CA	3.35	0.89	0.67	-0.09	0.69**	0.83**	-
6. JSO	2.84	1.21	0.29	0.11	0.36**	0.41**	0.39**

*:$p < 0.05$; **:$p < 0.01$

The standardized effect value for the mediating role of CA between CSE and JSO (path 2) was 0.11, 95% confidence interval (-0.03, 0.11), and the results included 0, indicating that the results were not significant and research hypothesis 4 was not confirmed. The standardized effect value for the chain mediating role of CE and CA between CSE and JSO was 0.07, 95% confidence interval (0.08, 0.28) did not include 0. The chain mediation effect was significant, and the relative mediation effect was 11.67%. It can be seen that although CA cannot directly contribute to the relationship between CSE and JSO, it can enhance the connection between CSE and JSO with the help of CE and research hypothesis 5 was confirmed. The specific results are shown in Table. 3 and Fig. 3.

Discussion

The purpose of this study was to analyze the impact of CSE on JSO and the mediating role that CE and CA play in this relationship. Cross-sectional data of 310 senior graduates from a different region of China provided data to support our study. First, the present study found that CSE significantly and positively predicted JSO, which is similar to previous studies in that people with better self-perceptions and evaluations are more likely to have better future career plans and obtain better outcomes (Bakker & van Woerkom, 2018). This phenomenon can be explained by CCT's theoretical model of why better individual motivation drives individuals to achieve better career results. Specifically, individuals with higher CSE can have stronger internal motivation to stimulate them to face their future employment positively and have the confidence to overcome the difficulties they may encounter (Erez & Judge, 2001). This study directly examines the effect of CSE on JSO. CSE plays an important role in the process and outcome of a college student's job search, as it represents the individual's subjective evaluation of self, and can help the individual to better execute plans and motivate to achieve desired goals. Individuals with better CSE apparently remain more optimistic in their career and job search plans, will be driven by the self to take some positive career exploration behaviors in advance, and further enhance their own adaptability in the continuous friction between self and environment to pursue their career development.

Second, the present study provides evidence for the chain mediating role of CE and CA between CSE and JSO. Although previous studies have suggested a relationship between CE, CA, and CSE (Liu & Zhang, 2017),

Table 3 Path analysis

	Effect Value	Boot standard error	95% confidence interval		p	Relative mediating effect
			Boot LLCI	Boot ULCI		
Total effect	0.26	0.07	0.18	0.32	0.000	/
Direct effect	0.04	0.12	-0.05	0.15	0.009	/
Total mediating effect	0.22	0.19	0.13	0.33	0.000	84.62%
Path 1	0.08	0.09	0.05	0.21	0.013	30.77%
Path 2	0.11	0.14	-0.03	0.11	0.100	42.31%
Path 3	0.07	0.08	0.08	0.28	0.000	11.67%

Path 1: CSE-CE-JSO; Path 2: CSE-CA-JSO; Path 3: CSE-CE-CA-JSO

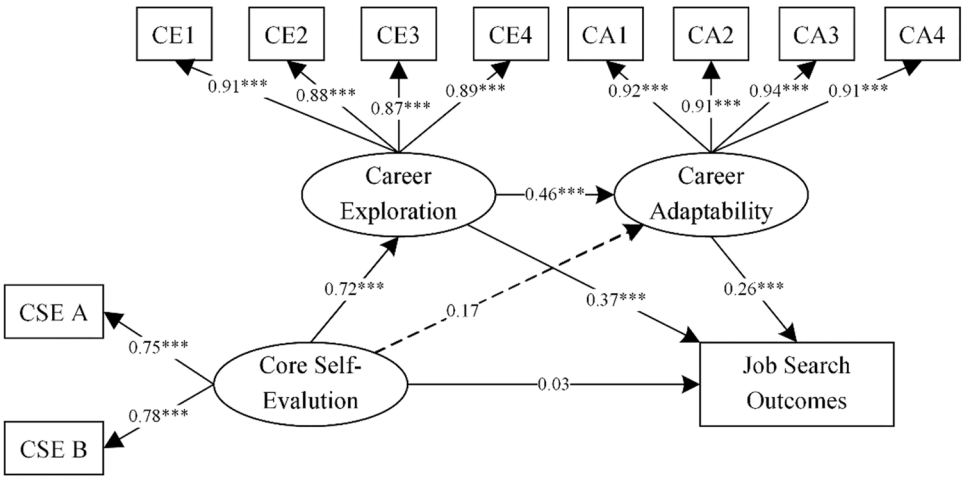

Fig. 3 Standardized Relationship Path Diagram. Note: CE1: environmental exploration; CE2: self-exploration; CE3: purpose-system exploration; CE4: amount of information; CA1: career concern; CA2: career confidence; CA3: career curiosity; CA4: career control

they have not verified what mechanisms of action exist between CE and CA in CSE and JSO. Individuals with higher CSE were more likely to actively engage in CE and demonstrate better JSO, while CA did not play a role in this relationship, possibly because CA can only play a supporting role as a psychological factor and needs to be based on other possible variables to influence adaptation outcomes to influence the adaptation outcome (Kaur & Kaur, 2021). Further, CA as a core factor of career development may require processes such as CE before it can really take shape and thus have an impact on the future employment of college students. This explains why the chain mediating effect holds.

Third, the finding that CSE can have an impact on JSO through CE extends our understanding of the mechanism of CSE's effect on JSO. Consistent with previous studies, CE was able to exert a significant positive effect on CSE and JSO. It is worth mentioning that this study found a greater effect of CSE on JSO after CE. In other words, CSE can trigger individuals to actively participate in CE, thus acquiring more comprehensive employment resources and maturing their mindset to form appropriate career plans to match better employment through the process of CE, helping them to have sustainable ability to adapt and sustain employment advantage resources in the future.

Fourth, this study found that CE and CA can produce a chain mediating effect in the impact of CSE on JSO. This finding is consistent with CCT that individual traits can shape career readiness and employment adaptation through career development management and planning (Del Corso & Rehfuss, 2011). More importantly, CA was shown to require actual career practice to be consolidated, which in turn affects actual career outcomes. This finding can be explained by the Cognitive Information Processing Theory (Reardon & Wright, 1999), which states that established cognitions need to go through a practice-knowledge-practice process to be truly formed in the actual process. This means that explaining JSO solely in terms of CA is one-sided, and although existing studies confirm that CA is associated with CSE and JSO, the real mechanism of action may be the conclusion drawn from the examination of this study, which helps us to talk about other mechanisms of action of CA in the future.

This study can provide some valuable suggestions for university career offices and labor market managers. First, the positive effect of CSE on JSO suggests that the departments concerned can find their values and strengths by motivating individuals to CSE in order to achieve better future employment. For example, group guidance is effective in improving CSE (Yang et al., 2014). During the group guidance, teachers introduce effective ways to help students discover their hobbies and strengths, which can stimulate curiosity and motivate them to explore their areas of expertise. Second, the significant chain mediating role played by CE and CA suggests that to obtain better employment, the authorities should pay attention to the career education of college students. Since career education is not mature in China, it is a focus for future authorities rather than simply looking at employment outcome data. Career Education can provide more methods and approaches of CE, and pay attention to the changes of CA of college students, which can effectively improve the quality of employment of college students (Jorgenson & Spooner, 1981). Third, designing and planning career courses and internships among college students that are more practical rather than coping is an effective way to enhance the future employment of college students. For example, most universities in China have started to establish career and entrepreneurship guidance centers, which can not only take advantage of the center to systematically develop effective courses, but also cooperate with enterprises to provide more internship and employment opportunities for college students in a "school-enterprise cooperation" model.

Limitation

There are still some limitations of this study. First, it is clear that there are more than the three variables involved in this study that affect college students' JSO. However, it is important to note that this study did not include the effect of labor market factors on JSO, which is a part of future research that could go deeper. Second, this study used self-reported cross-sectional data, and to further reduce the impact of common method bias, future studies should attempt to conduct longitudinal follow-up data to verify the reliability of the existing findings. Third, this study analyzed the relationship between CSE and JSO through a chain mediating effect. It is worth noting that although gender did not have a significant effect on this, regional differences caused a significant correlation between CSE and CE, and this difference may affect individuals' CSE and limitation of CE. Fourth, as previously noted with regard to employment difficulties, this study for the first time used CCT to include all dimensions in the statistics and produced significant results, which enriches the explanatory strength of the theory. However, this study did not take into account situational factors, which is a focus on which future research could be worthy of attention. Finally, although this study is based on CCT, the hypothetical model of the study and the causal relationship between the variables are derived. However, the existence of other causal relationships between CSE, CE, CA, and JSO needs to be continued to be explored in future studies.

Appendix

Table 4 Core Self-evaluation

No	Items
1	I am confident I get the success I deserve in life
2	Sometimes I feel depressed
3	When I try, I generally succeed
4	Sometimes when I fail I feel worthless
5	I complete tasks successfully
6	Sometimes, I do not feel in control of my work
7	Overall, I am satisfied with myself
8	I am filled with doubts about my competence
9	I determine what will happen in my life
10	I do not feel in control of my success in my career
11	I am capable of coping with most of my problems
12	There are times when things look pretty bleak and hopeless to me

Table 5 Job Search Outcomes

No	Items
1	How many interview notices did you receive in the job search process?
2	How many offers did you receive in the job search process?
3	Are you satisfied with the results of your own employment?

Table 6 Career Exploration

No	Items
1	Learn about possible career paths
2	Get information about a specific position or company
3	Proactively seek information from someone who knows someone in the career field I am interested in
4	Obtain information about various types of employment and general employment opportunities in my career field of interest
5	Seeking information about the career field I am interested in
6	Pay attention to my personality, interests, abilities, and other personal characteristics
7	Participate in a variety of career guidance activities to clarify my employment orientation
8	Think about what kind of work I am suitable for
9	Think about my past experiences
10	Think deeply about how my future career path will go
11	Think about how to integrate my past experiences into my future career development
12	Experience a variety of different career activities
13	Look for opportunities to prove your skills
14	Try out various specific job roles to determine if I like them
15	How much do you intend to know about the main elements of the career field you are interested in?
16	How much do you know now about positions, units, and the job market?
17	How much do you know about your employment options in terms of personal preferences, abilities, and employment directions?
18	How much do you know about how to plan your future career path?

Table 7 Career Adaptability

No	Items
1	Thinking about what my future will be like
2	Realizing that today's choices shape my future
3	Becoming aware of the educational and career choices that I must make
4	Planning how to achieve my goals
5	Concerned about my career
6	Preparing for the future
7	Keeping upbeat
8	Making decisions by myself
9	Taking responsibility for my actions
10	Sticking up for my beliefs
11	Counting on myself
12	Doing what's right for me
13	Exploring my surroundings
14	Looking for opportunities to grow as a person
15	Investigating options before making a choice
16	Observing different ways of doing things
17	Probing deeply into questions I have
18	Becoming curious about new opportunities
19	Performing tasks efficiently
20	Taking care to do things well
21	Learning new skills
22	Working up to my ability
23	Overcoming obstacles
24	Solving problems

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Data Availability The data and materials are available upon request from the corresponding author.

Code Availability The study code is available upon request from the corresponding author.

Declarations

Ethics Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to Participate Consent was obtained from all participants included in the study.

Consent for Publication Consent was obtained from all participants included in the study.

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