ORIGINAL RESEARCH

Linking Career Exploration, Self-Reflection, Career Calling, Career Adaptability and Subjective Well-Being: A Self-Regulation Theory Perspective

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Introduction: In the post-pandemic era, the cultivation of vocational adaptability among college students holds equal significance to fostering subjective well-being in the face of an increasingly daunting professional landscape. This intricate process can be influenced by exploratory expeditions into potential career paths, sincere introspection, and a profound sense of vocation.

Methods: Drawing upon Bandura's self-regulation theory, this research project employed structural equation modeling (SEM) to scrutinize the interconnectedness between career exploration, self-reflection, vocational calling, vocational adaptability, and subjective well-being within a sample of 1077 Chinese undergraduates.

Results: The findings demonstrated that career exploration and self-reflection positively predicted career adaptability and subjective well-being. In addition, career calling had a significant mediating effect in this model.

Conclusion: The findings of this study shed light on the significance of career exploration and self-reflection in fostering both adolescent career adaptability and subjective well-being. And are expected to provide a reference for the career construction and development of college students and career education in colleges and universities.

Keywords: career exploration, self-reflection, career calling, career adaptability, subjective well-being

Introduction

University is a critical period for an individual's career development, which is a period of preparation before entering the workforce.[1] As per data furnished by China's Ministry of Education, the number of college graduates soared to a staggering 10.76 million in 2022, representing a year-on-year increase of 1.67 million. Against the backdrop of a burgeoning workforce and the ramifications of the novel coronavirus pandemic on the economy, the employment prospects confronting these graduates are daunting and intricate.[2,3] Thus, fortifying their career adaptability assumes particular significance, equipping them with the capacity to navigate and acclimate to fluctuations and circumstances. Career adaptability is a good indicator to measure the ability of individuals to prepare, adapt and adjust to social and environmental changes, including career concern, career curiosity, career control, and career confidence.[4] It plays a crucial role in the development and construction of an individual career, affecting future career satisfaction, salary, job performance and other important factors.[5,6]

At the same time, there is an increasing concern for people's inner experiences which is no exception in the field of individual career development.[7–9] Most adolescents and young adults are free of serious physical illness, yet they experience and report considerable psychosomatic, career and psychological distress symptomatology.[10] Psychosocial factors may play a decisive role in distress.[11] Among them, individual psychosocial health is closely related to career

development. Studies have shown that career development is significantly related to life experience factors, such as life satisfaction and happiness.[12] It is evident that life experience and career development are equally important,[13] that is, how to maintain good psychological health and positive life under the dual pressures of social mental health and personal physical and mental health. Therefore, in addition to focusing on the development of university students' occupational adaptability, it is also necessary to explore their life situations.

Therefore, this study selects subjective well-being, a widely agreed factor for evaluating daily life experiences,[14] into the analysis framework, focuses on the influence mechanism of career adaptability and subjective well-being and explores the role of career exploration and self-reflection in it. According to self-regulation theory, individuals can enhance the maintenance and regulation of their behavior by setting behavioral standards for themselves through available elements, including three dynamic and cyclical processes of self-observation, self-judgment, and self-reaction.[15] Among them, self-reaction is expressed as an internal experience and reaction, such as career adaptability and subjective well-being in this study, influenced by self-observation and judgment. Research has shown that career exploration provided extensive career information is an important influencing factor in facilitating the development of career adaptability,[16,17] which is similar to self-observation in which individuals provide the necessary information to achieve regulation and self-direction of their behavior and cognition. In addition, self-reflection can help individuals understand and clarify their career goals, and further improve career adaptability through deep learning about past experiences.[18] This process usually involves comparison and evaluation of current situation and previous experiences as well as future expectations,[19] which is a form of self-judgment.[20] Based on this, the present study views career exploration (self-observation) and self-reflection (self-judgment) in an individual's career development as a regulatory process for individuals to enhance career adaptability and subjective well-being (self-reaction).

However, in general, there are some debates about the role of career exploration and self-reflection in career development: on the one hand, the relationship between the effects of career exploration and career adaptability has not been determined, and there are studies on both the former's effects on the latter[21] and the latter's effects on the former;[22] on the other hand, the role of self-reflection in individual career development is not always positive and it may not lead to self-growth and development.[23] Therefore, it is necessary to further explore what the mechanism is about those variables and the present study adds the following aspects: based on self-regulation theory, we first explore the impact of career exploration and self-reflection on career adaptability and subjective well-being. Secondly, we explore the role of calling in career development. As the core of helping people to understand their life and work comprehensively,[24] career calling influenced by personal and environmental factors is closely related to self-regulation.[25] Studies have defined calling in different methods and it is generally accepted that it can adapt to changing environments and emphasizes a sense of personal meaning.[26] Thus, career calling with motivational power tend to be "improvers" who actively adapt and experience well-being.[27,28] We, therefore, propose that career calling mediates the effects of career exploration and self-reflection on career adaptability and subjective well-being (Figure 1).
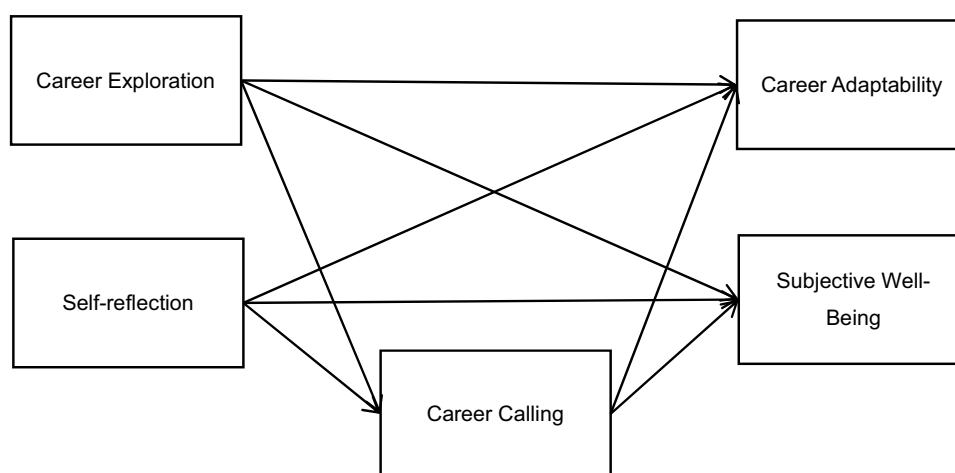

Figure 1 Theoretical framework.

The contribution of this study is mainly reflected in the following aspects. First, based on self-regulation theory, we unified career exploration and self-reflection into the analytical framework and explored the interaction between the two in the construct of career development. Second, we explore subjective well-being as an analytical variable to jointly focus on the career and life development of students. Finally, we extended the literature related to career calling to further consider the role of career exploration and self-reflection, providing more evidence for the research related to calling and career adaptability.

Theory and Hypothesis Development
Career Exploration, Self-Reflection and Career Adaptability

As a purposive behavior and cognitions in the process of career development,[17] career exploration plays an important role in the transition period of students from university to social work.[29] Career exploration includes self-exploration and environment exploration.[17] The former is committed to exploring their own career interests and abilities, forming a career self-concept and understanding the impact of their own traits on career development;[30] the latter focuses on exploring the external environment and discovering employment information, opportunities and obstacles.[17] Through the exploration of inner interests and values as well as opportunities and obstacles in the external environment, individuals can know how to shape their future career and make career decisions.[17,30] Existing research shows that active exploration in career development can promote curiosity and concern for possible future vocation,[31] further clarify career development goals and make more career-adaptive behaviors.[32]

Self-reflection refers to a purposeful and intentional cognitive process through which individuals can understand and reconstruct the meaning of past experiences.[19] In the field of career development, individuals' reflection is considered as a good predictor of career adaptability.[18] Classroom's education research based on self-reflection has also been confirmed to help students acquaint with themselves and improve their career adaptability.[33] Since self-reflection can strengthen the cognition of individual experience and make effective improvement through the examination and evaluation about their own thoughts, behaviors, results and emotions,[34,35] it would help individuals to self-regulate effectively and thereby adjust flexibly their own professional requirements and adapt changes in work environment.[36]

According to self-regulation theory, individuals will search for information from various aspects through self-observation, and then make self-judgment and self-evaluation to regulate their cognition, emotion and behavior.[37] The process of individual exploration and self-reflection on their own career can be regarded as a kind of observation and judgment about their own internal and external conditions, which may help individuals fully grasp information and produce more adaptive behaviors in career development. Studies have shown that individuals' exploration and reflection of their self-characteristic and career-related environment facilitates the acquisition of information and the making of judgments and decision.[30,36,38–40] At the same time, self-regulation is associated with variables in career development such as career management, career construction and career maturity, and is a measure of career adaptability.[41–43] Thus, career exploration and self-reflection have an impact on career adaptability. Combining all of the above analyses, the following hypotheses are proposed:

Hypothesis 1(a): Career exploration positively predicts career adaptability.

Hypothesis 1(b): Self-reflection positively predicts career adaptability.

Career Exploration, Self-Reflection and Subjective Well-Being

Bandura,[15] proposed in self-regulation theory that individuals have an inner experience following self-observation and self-judgment, such as self-satisfaction, pride, and self-complaint. This experience in the mind is called self-reaction which is based on the evaluation of the individual's behavior. The sense of meaning and well-being experienced by an individual is also an inner experience, which is closely related to self-regulation.[44] In the process of individual career construction, career exploration is positively correlated with career decision-making self-efficacy, career support, employability and other factors.[45,46] These factors tend to help individuals establish a positive and healthy psychology.[47,48] Specifically, study has found that individuals have higher satisfaction and greater sense of achievement

when they engage in work after career exploration.[49] Similarly, it also leads to higher levels of life satisfaction which is considered to be a valid predictor of subjective well-being.[44,50] It can be seen that career and life are closely related, which is confirmed by numerous researchers.[47] Therefore, in the present study, career exploration can not only affect an individual's career development, but this effect may also migrate to an individual's internal experience and affect their life satisfaction.

In addition, self-reflection helps individual to detect and reflect on the meaning of the activities they want to engage in, their own mind and effectiveness so as to form self-judgment and to promote cognitive revision.[15] As a cognitive self-awareness, self-reflection is associated with many positive psychological qualities.[51,52] Study demonstrated that self-reflective individuals are more inclined to seek meaning and have a stronger sense of meaning in life.[53] A greater sense of meaning in life, and therefore the sense of subjective well-being, may also be stronger.[54] Moreover, Stein and Grant[55] point out self-reflection can enhance the level of well-being through insight. And it can also moderate the negative effects of rumination on well-being.[56] So considering the positive effect of self-reflection, those who actively reflect may be happier in their inner experience. Combining all of the above analyses, the following hypotheses are proposed:

Hypothesis 2(a): Career exploration positively predicts subjective well-being.

Hypothesis 2(b): Self-reflection positively predicts subjective well-being.

Mediating Role of Career Calling

In recent years, calling has received widespread attention in the field of research on career development and work. Previous studies have confirmed some career exploratory variables such as vocational identity and career thoughts facilitates the evocation of calling.[57] In a similar vein, high levels of career exploration have been shown to be associated with an increase in career calling, which play an important mediating role in the influence of family influences and work ethic on career calling.[58] This suggest that individuals' exploratory behavior in career development may be a good predictor of career calling. Moreover, career calling that is considered to have an incentive force, pro-social effect and other realistic meanings are also influenced by self-reflection and self-evaluation. Some studies confirm the idea that, on the one hand, calling may originate from internal self-reflection and require intense self-exploration;[59,60] on the other hand, positive core self-assessment is more likely to develop career calling.[61] Therefore, there may be a correlation between self-reflection and career calling.

According to self-regulation theory, an individual's self-reaction and behavior is based on the evaluation caused by self-judgment and self-observation, involving the regulation of cognition, emotion, and behavior in career development.[15] And the regulation of such psychological processes has been found to be positively associated with living a calling.[25] From the theoretical perspective, the self-evaluation formed by individual's career exploration and self-reflection triggers different levels of career adaptability and subjective well-being, which is closely related to the achievement of standards and the realization of one's own values and meanings. And career calling just happens to involve seeking and realizing one's sense of value and meaning.[62] Studies have shown that career calling plays a positive role in realizing the meaning of work.[63] Individuals with a high sense of calling give more meaning to their career and life and show more enthusiasm, beliefs and career commitment.[63–65] Under the influence of this sense of calling, individuals are more adaptable in their career development,[66] as well as more able to maintain good mental health and improve life satisfaction and well-being.[67,68] It can be implied that under the influence of career exploration and self-reflection, if an individual's self-judgment can meet the standard and fulfill the career calling, it will be conducive to the positive self-response.

Combining the above paragraph, career calling is a result of career exploration and self-reflection, as well as an element related to self-evaluative, which has an impact on the self-responses of career adaptability and subjective well-being. We therefore hypothesize that calling may be a mediator influenced by career exploration and self-reflection that can facilitate self-responses and behaviours. Therefore, we propose the following hypothesis:

Hypothesis 3(a): career calling will mediate the relationship between self-reflection, career exploration and career adaptability.

Hypothesis 3(b): career calling will mediate the relationship between self-reflection, career exploration and subjective well-being.

Materials and Methods

To explore the influencing mechanism of career adaptability and subjective well-being of Chinese college students. This study explored the effects of career exploration and self-reflection and their interaction on career calling, career adaptability and subjective well-being, as well as the mediating role of career calling according to the self-regulation theory.

Participants and Procedures

In this study, a sample of 1321 college students was drawn in 2021 using whole-group sampling, and the data were mainly obtained from students in different majors and departments at several universities in Southwest China. We contacted the relevant counsellors from different departments and majors in the three colleges to inform them of the purpose of our research and to ask for their help. With the help of the counsellors, we collected comprehensive data. At the same time, career exploration, self-reflection, career calling, career adaptability and subjective well-being were measured at different time points over a three-week period in order to avoid homogenous methods and to improve the validity of the data. At the first time point (T1), data about respondents' personal information were collected and self-reflection and career exploration were measured in turn. During the second time point (T2) a week later, their career callings were measured. Finally, the third time point (T3) saw both career adaptability and subjective well-being being measured. Moreover, this research has set up the last four digits of the respondents' mobile phone numbers separately so that the data corresponding to the abovementioned variables could be effectively matched.

After the questionnaires were collected, 1077 valid questionnaires were obtained by matching the last four digits of the mobile phone number and screening and matching according to the criteria of "completeness of the questionnaires, inconsistencies and logical errors in the questionnaires", with a sample recovery of 81.5%. The characteristics of sample data are shown in Table 1.

This study used SPSS to analyze and process the data. The study began with descriptive statistics and correlational analyses of participants' background information, career exploration, self-reflection, career adaptability and other variables. Secondly, simple regression analysis and multiple linear regression analysis were used to examine the relationship between career exploration, self-reflection and career adaptability, subjective well-being. Finally, the mediating model proposed in the study was tested using structural equation modelling.

SPSS was used to analyze and process the data, while descriptive statistics and correlation analysis were conducted for participants' background information, occupational pressure, career exploration and other variables. Secondly, simple regression analysis and multiple linear regression analysis are used to test the relationship among occupational stress, career exploration, career planning and career hesitation. Finally, the proposed mediation model is tested by structural equation model.

Measurements

The variables were measured in this study using mature Western scales. Considering the differences between Chinese and Western contexts and the applicability of the scale, a translation-back-translation process was conducted[69] and 15 undergraduates were pre-tested before the formal survey, and some items were modified based on the feedback.

Career exploration was measured by The Career Exploration Scale, developed by Stumpf et al.[17] The scale is based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and includes two subscales, environmental exploration and self-exploration, with 11 questions such as "I went to various career orientation programs". Cronbach's alpha for this scale was at 0.90.

Table 1 Sample Description and Demographic Characteristics (N=1077)

Background Characteristics		N	(%)
Gender	1=male	243	22.6
	2=female	834	77.4
Age	1=under 18	110	10.2
	2=between 19 and 20	638	59.2
	3=21 and above	329	30.6
Major	1=science	61	5.7
	2=Management	5	0.5
	3=Economics	169	15.7
	4=Engineering	115	10.7
	5=Law	6	0.6
	6=Education	30	2.8
	7=Literature	3	0.3
	8=History	688	63.9
Grade	1=freshmen	491	45.6
	2=sophomores	250	23.2
	3=juniors	307	28.5
	4=seniors	29	2.7
Parents level of education	1=Junior high school and below	648	60.2
	2=High school or technical secondary school	269	25
	3=junior college	81	7.5
	4=Undergraduate	74	6.9
	5=postgraduate or above	5	0.5
Parent occupation type	1=freelance	868	80.6
	2=enterprise	126	11.7
	3=government or public institution	83	7.7

Self-reflection was measured using the scale developed by Peltier et al.[70] The scale is based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and consists of five items such as "I often tried to think about how I could do something better next time". Cronbach's alpha for this scale was at 0.91.

Career calling was measured by the Chinese Calling Scale (CCS), developed by Zhang et al.[71] The scale with 11 questions is based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and includes three dimensions: Altruism; Guiding force; Meaning and purpose. The dimensions of career calling are not distinguished in our study, but rather they are used as an overall indicator. Specific items such as "A calling from some kind of power makes me to choose my future career". Cronbach's alpha for this scale was at 0.93.

Career adaptability was measured by The Career Adaptability Scale, developed by Hou et al.[72] The scale with 24 questions is based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and includes four dimensions: career concern, control, curiosity, and self-confidence. Examples include: "Becoming aware of the educational and career choices that I must make". Cronbach's alpha for this scale was at 0.97.

Subjective well-being was measured by The Satisfaction with Life Scale, developed by Diener et al.[73] The scale with 5 questions is based on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Examples include: "If I could live my life over, I would change almost nothing". Cronbach's alpha for this scale was at 0.88.

Demographics. We obtained demographic variables such as gender, age, students' year of study, major, parents' level of education, and parent occupation type. Descriptive statistics and correlations of each of the variables collected in this study are shown in Table 2.

Table 2 Descriptive Statistics and Correlations Analysis

	1	2	3	4	5	6	7	8	9	10	11
1=Gender	1										
2=Age	−0.03	1									
3=Grade	0.00	0.68**	1								
4=Major	0.11**	0.13**	0.16**	1							
5=Parents level of education	−0.03	−0.02	0.06	−0.03	1						
6=Parent occupation type	0.00	−0.05	0.03	−0.04	0.54**	1					
7=Career exploration	−0.09**	−0.01	0.04	−0.05	0.08*	0.08*	1				
8=Career adaptability	−0.04	0.00	0.05	−0.02	0.00	0.04	0.49**	1			
9=Self-reflection	−0.03	−0.02	0.01	−0.04	−0.01	0.01	0.36**	0.54**	1		
10=Career calling	−0.01	0.02	0.06	−0.11**	0.03	0.04	0.36**	0.51**	0.52**	1	
11=Subjective well-being	−0.12**	−0.08*	−0.09**	−0.03	0.07*	0.02	0.30**	0.23**	0.24**	0.29**	1
Mean	1.77	2.22	1.88	6.29	1.62	1.27	3.05	3.88	3.55	3.62	4.00
SD	0.42	0.63	0.91	2.42	0.92	0.59	0.67	0.64	0.68	0.62	1.04

Notes: N = 1077. *p < 0.05, **p < 0.01.

Results

We used Harman's single factor test[74] to estimate the potential effects of common method bias in our results. This test models all items into one factor and examines the unrotated solution. It extracts a total of 8 factors with characteristic roots greater than 1. The total variance explained by that factor was 36.83%, well below the cumulated variance limit [40%] suggested by Podsakoff et al.[75] Therefore, common method bias is not a major challenge to interpretation of our results.

We conducted a confirmatory factor analysis and tested the hypothesized 5-factor model with career exploration, self-reflection, career calling, career adaptability, and subjective well-being. The model fit the data well (χ^2/Df[681]= 2.92, $p < 0.001$; IFI= 0.95; TLI= 0.94; CFI= 0.95; RMSEA=0.04), suggesting that participants were able to distinguish our key constructs. We also ran three alternative models merging pairs of constructs, and one model with a single-factor solution. None of these alternative models showed better fit indices than the hypothesized model (Table 3).

The following results transpired from the model as shown in Figure 2. Career exploration positively predicted subjective well-being ($p < 0.001$), career adaptability (B= 0.28, β= 0.34, $p < 0.001$) and career calling (B= 0.16, β= 0.18, $p < 0.001$). Supporting prediction H1a, H2a. Meanwhile, career calling positively predicted both subjective well-being (B = 0.20, β = 0.14, $p < 0.01$), and career adaptability (B = 0.19, β = 0.22, $p < 0.001$). Thus, career calling played a mediating role in the effect of career exploration on subjective well-being (B= 0.09, β= 0.14, 95% CI = [0.10, 0.18]), and played a mediating role in the effect of career exploration on career adaptability (B= 0.13, β= 0.14, 95% CI = [0.10, 0.17]). Supporting the prediction Hypothesis 3a that career calling mediate the relationship between career exploration and career adaptability; in Hypothesis 3b, career calling mediate the relationship between career exploration and subjective well-being.

Self-reflection positively predicted subjective well-being (B = 0.14, β = 0.10, $p < 0.05$), career adaptability (B= 0.26, β= 0.31, $p < 0.001$) and career calling (B= 0.43, β= 0.45, $p < 0.001$). Supporting prediction H1b, H2b. Similarly, the

Table 3 Confirmatory Factor Analysis

Model	χ^2/Df	IFI	TLI	CFI	RMSEA
1. Benchmark Model (CE, SR, CC, CA, SWB)	2.92	0.95	0.94	0.95	0.04
2. Four factor model (CE+SR, CC, CA, SWB)	4.26	0.91	0.90	0.91	0.06
3. Three factor model (CE+SR+CC, CA, SWB)	5.42	0.87	0.86	0.87	0.06
4. Two factor model (CE+SR+CC, CA+ SWB)	6.83	0.83	0.82	0.83	0.07
5. One factor model (CE+SR+CC+CA+ SWB)	8.28	0.79	0.77	0.79	0.08

Abbreviations: CE, career exploration; SR, self-reflection; CC, career calling; CA, career adaptability; SWB, subjective well-being.
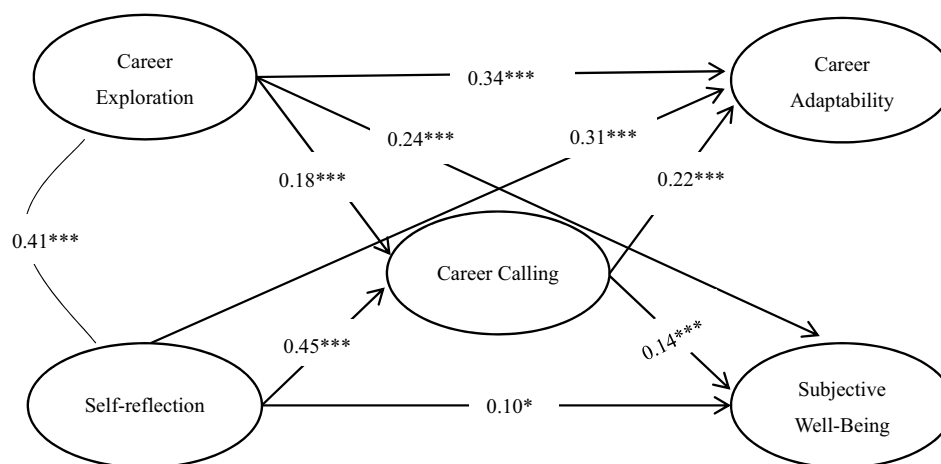
Figure 2 The meditation model with standardized coefficients. *$p<0.05$, ***$p<0.001$.

career calling played a mediating role in the effect of career exploration on the subjective well-being (B= 0.10, β = 0.15, 95% CI = [0.07, 0.12]), and mediating role in the effect of career exploration on career adaptability (B = 0.19, β = 0.17, 95% CI = [0.14, 0.22]). Supporting the prediction Hypothesis 3a that career calling mediate the relationship between self-reflection and career adaptability; in Hypothesis 3b, career calling mediate the relationship between self-reflection and subjective well-being. In sum, Hypothesis 3 is fully supported.

Discussion
Theoretical Implications

The present study provides several theoretical implications: first, based on the majority of studies exploring the effects of career exploration or self-reflection on career development domain, this study further considered the combined effects of both and enriched the application of self-regulation theory in career management-related studies. The results indicated that, consistent with hypotheses 1 and 2, both career exploration and self-reflection can promote the development of career adaptability and subjective well-being. Sulistiani and Handoyo[76] reviewed the literature on the influencing factors of adolescent career adaptability and its impact in the context of education and found a positive relationship between adaptability, life satisfaction and exploration, but there is still a lack of research on the connection between reflection and exploration in the career preparation stage. Therefore, the present study makes a supplement for this. At the same time, Son[18] and Stein and Grant[55] examined the role of reflection in career adaptability and satisfaction. Our study therefore further supports these finding. Specifically, we found that career exploration had a slightly greater effect than self-reflection on career adaptability, and career exploration played a greater role on subjective well-being in exploring the joint effect. This indicates the importance of career exploration in individual career development and physical and mental health.

Second, when examining the mechanisms influencing career adaptability and subjective well-being, our study finds that students who engage in career exploration and self-reflection possess higher levels of career adaptability and subjective well-being, and this relationship could be explained by the mediating variable of career calling. This result is consistent with hypothesis 3. That is, students who explore their occupational environment and self or reflect on themselves are more adaptable to changes in their career field and perceive more well-being factors,[16,18] partially because they are committed to seeking own intrinsic meaning and value, which have a high level of career calling driven by their internal dynamic for career development.[26] Wen et al[77] examined the mediating role of calling in the relationship between prospective personality and career adaptability, but the authors noted that there was still less attention to the antecedents of calling than its consequences. Therefore, our study used career exploration and self-reflection as antecedent variables to provide further evidence and enrich its antecedent research for the relationship between calling and adaptation. From the theoretical perspective, this study integrates the three sub-processes of Bandura's self-

regulation into our analytical framework to explore the role of calling in the influence of self-observation and self-judgment on self-response and behavior. It extends the application of self-regulation theory based on a social cognitive perspective to the vocational domain.

Practical Implications

The results of this study are expected to provide a reference for the career construction and development of college students and career education in colleges and universities.

First, students should actively explore and reflect to discover and realize calling, so as to lay a good foundation for improving their adaptability and subjective well-being. Career exploration and self-reflection can help to obtain information from various aspects, thus increasing certainty in career selection and accumulating relevant resources.[78] Specifically, college students should understand and know themselves through self-questioning (eg, what do I like? What do I want?) to seeking the meaning of life and searching a calling. In addition, students should reflect on their own personality and abilities based on self-knowledge, find a career direction that suits them, and consciously plan ahead to help perceiving a calling. Finally, they should learn to use external resources such as school, self, network and other platforms, and through practices such as part-time jobs and volunteer activities, to test own abilities and to examine the degree of fit between person and profession. Meanwhile, they should also learn about career information through indirect ways such as others' descriptions or the Internet. Through the above practical activities to succeed in living a calling.

Second, schools and teachers should provide students with timely and extensive support for exploration and reflection, and to promote their vocational calling with care. Firstly, in daily career education courses, schools and teachers should pay attention not only to the theoretical foundation related to career development such as self-education and career literacy but also to the skills education of career exploration such as how to search for career information and career practice channels. Secondly, schools should also provide extracurricular career construction services for students and help them effectively deal with difficulties or doubts in the process of exploration and reflection. For example, setting up career counseling rooms, establishing a database of career expectations and plans. Finally, in terms of promoting students' career callings, teachers or counsellors should enhance students' subjective consciousness and the sense of meaning in thinking about themselves and the employment environment, and help them to develop their own regulating mechanisms to increase their level of career callings.

Limitations and Future Research

There are still some limitations in this study. First of all, this study only collects data from the perspective of students in the process of career development, without considering the role of external factors. However, individuals often cannot develop their careers without the involvement of external factors, especially in the early stages of career exploration during university. Studies have shown that external variables play an important role in career development, such as social support, parental career behavior, and education and training experience.[76,79] Therefore, future research could expand the study of these external factors in career development, such as the relationship with counselors, the campus learning atmosphere, geographical and climatic differences.

In addition, in the Chinese cultural context, which has emphasized the spirit of reflection and introspection since ancient times, the results of this study may differ from those of individuals in other cultural backgrounds. Ma et al[80] found that individuals in different cultures adopt different strategies of self-reflection, while Chinese culture places more emphasis on self-interpretation and construction in social relationships. Similarly, from a neuroscientific perspective, Zhu and Han[81] found that Chinese people place more emphasis on the relationship between the self and others compared with Westerners who focus more on the independent self, and this difference in social cognition gives rise to different self-representation and self-identity. Furthermore, self-regulation theory states that individuals also consider social factors and make social comparisons when making self-judgments and evaluations.[15] Therefore, different cultures and social contexts have different ways of thinking and adopt different reflective strategies,[80,81] focusing on information with different sources and priorities,[82] and may result in inconsistent self-reaction outcomes. The different results produced in this study, particularly its interaction with career exploration, may also be influenced by this factor. So exploring the influence of different cultures and societies is also a future direction.

Conclusion

The cultivation of career adaptability among university students is equally vital as the nurturing of their subjective well-being in the face of a challenging professional landscape. Broadly speaking, the findings of this study shed light on the significance of career exploration and self-reflection in fostering both adolescent career adaptability and subjective well-being. Our analysis revealed that career exploration had a slightly stronger impact than self-reflection on career adaptability, with career exploration also playing a more prominent role in enhancing subjective well-being when considering their combined effect. Students who actively engage in career exploration and self-reflection exhibit higher levels of both career adaptability and subjective well-being. This association can be understood through the mediating factor of career calling. Therefore, it is crucial to prioritize career guidance and ensure that schools and educators provide timely and comprehensive support to facilitate students' exploration of their career exploration and career callings. Although self-reflection contributes significantly, albeit to a somewhat lesser extent than the aforementioned factors, it still plays an important role in fostering career adaptability and subjective well-being when adolescents actively partake in exploration and self-reflection to uncover their aspirations.

Ethics Statement

It has obtained the ethical review and approval from the Ethics Committee of University of Electronic Science and Technology. All subjects gave written informed consent in accordance with the Declaration of Helsinki.

Disclosure

The authors report no conflicts of interest in this work.

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