



# Career Planning Decision-making of College Students Based on Cognitive Science

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## ABSTRACT

Under severe employment pressure and competition conditions, it is the first issue for college students to make career planning decisions suitable for their own development, which is of great significance for improving college students' career efficacy and career maturity. This paper studies the career planning decision-making of college students based on cognitive science theory. The results show that career decision-making should emphasize the relationship between human and information, and human and value, and realize the compatibility and accessibility of career desire through the cognition of personal and career matching. In the career planning decision-making stage, group counselling intervention can significantly improve the career maturity of college students, and has long-term effectiveness on improving career planning decision-making of college students. The analysis on cognitive science theory finds that the ultimate goal of career planning decision-making is to improve the ability of career decision-makers through scientific information processing ability.

**Key Words:** Career Planning Decision, Career Efficacy, Career Maturity, Cognitive Science

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## Introduction

Career planning and career development is the main axis of development of a person's life, and determines the survival, development and even self-realization of an individual to a great extent (Kim *et al.*, 2014). Similar to career development, career planning is a continuous process with different career planning and development goals at different stages (Seibert *et al.*, 2013; Török *et al.*, 2017). The university period is the key period of personal career planning, and the main task of this period is to make correct career decision. Whether college students can make correct career decisions is not only related to their employment, but also to their career development in the future (Karaca *et al.*, 2018). In many researches at home and abroad, professional psychologists take "career maturity" as an index to measure career development and career planning, the so-called career maturity is the core of understanding

career behavior from a developmental orientation and evaluating the level of career development of an individual with respect to his or her career development task (Jiang *et al.*, 2015; Datti, 2009). The higher the career maturity is, the easier it is to realize the goal of career planning. Therefore, promoting the career maturity of college students has become the first task to guide the employment of college students (Rottinghaus *et al.*, 2012; Mohd *et al.*, 2010).

In order to deeply understand the career decision-making of college students, many scholars have put forward traditional, standardized and even descriptive career decision-making theories. However, these theories are too quantitative and rational to be applied to contemporary college students (Owens *et al.*, 2015; Lee *et al.*, 2017). Braunstein-Bercovitz applied cognitive science to career decision-making for the first time and proposed

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cognitive science theory for the first time (Braunstein-Bercovitz, 2013). Cognitive science is a complex cross-disciplinary group, which combines many theories such as philosophy, psychology, linguistics and neuroscience. It provides a framework for the integration of disciplines (Gati *et al.*, 2010; Hanson *et al.*, 2016). College students are motivated by inner cognitive processes and emotions when they choose careers and make career decisions, and career decisions require motivation that results from self-understanding and the impact of the external environment (Fargen *et al.*, 2014). Based on cognitive science theory, this paper studies contemporary college students' career decision-making and career planning, to promote the integration of career decision-making and cognitive science theory.

### College students' attitude towards career development

#### Career decision-making and career self-efficacy of college students

Career decision-making is a complex cognitive process in which the decision-maker organizes information about self and career environment, obeys his or her psychological cognition to choose a career among a number of available choices, and makes a reasonable career choice (Meder *et al.*, 2013; Rosales *et al.*, 2017). College students' decision-making skills include general information processing skills used to process self-knowledge and career knowledge, including communication, analysis, synthesis, evaluation and execution. Figure 1 is a three-dimensional model of factors influencing self-efficacy. The factors determining career decision-making of college students are divided into external factors and internal factors. The internal factors are highly controllable. However, nowadays college students are faced with enormous economic pressure, employment pressure and environmental pressure. Many external pressure makes college students abandon a part of psychological cognition in the career decision-making process, give up the careers that they are interested in, prefer to the careers are in urgent need at present. Career self-efficacy directly affects the range of career choice and career choice behavior, and also affects career adjustment. Through cognition, motivation and emotion, it affects the degree of effort and persistence of individual career behavior while engaging in a certain career or job, and thus

affects individuals' work attitude. Figure 2 shows the career decision-making model. The career decision-making should emphasize the relationship between human and information, and human and value, and realize the compatibility and accessibility of career desire through the cognition of people and career matching.

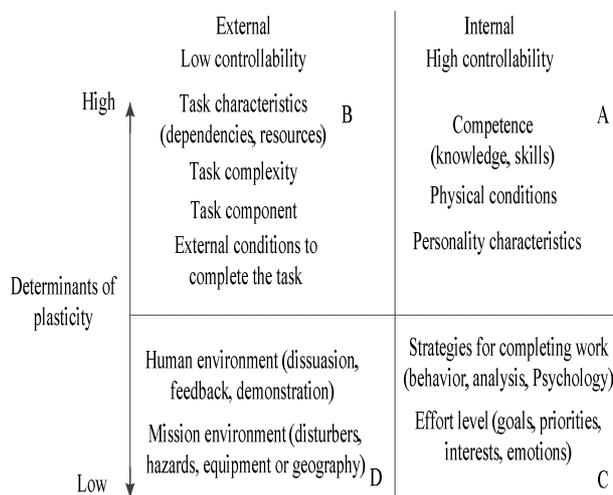


Figure 1. Three-dimensional model of self-efficacy influencing factors

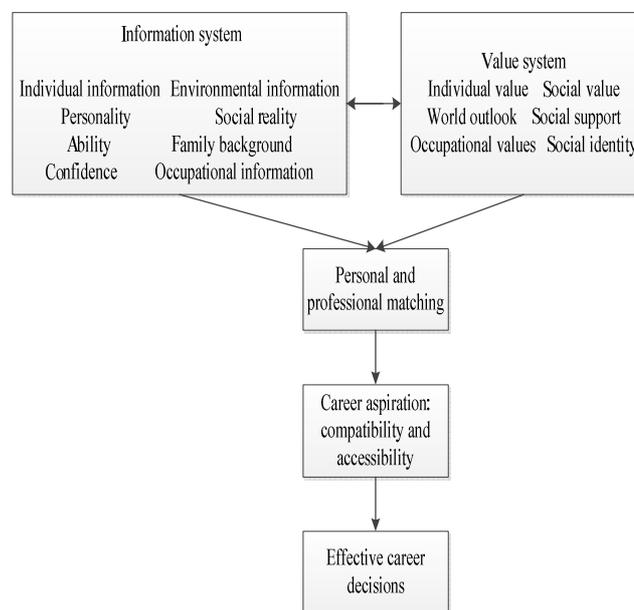


Figure 2. Effective career decisions

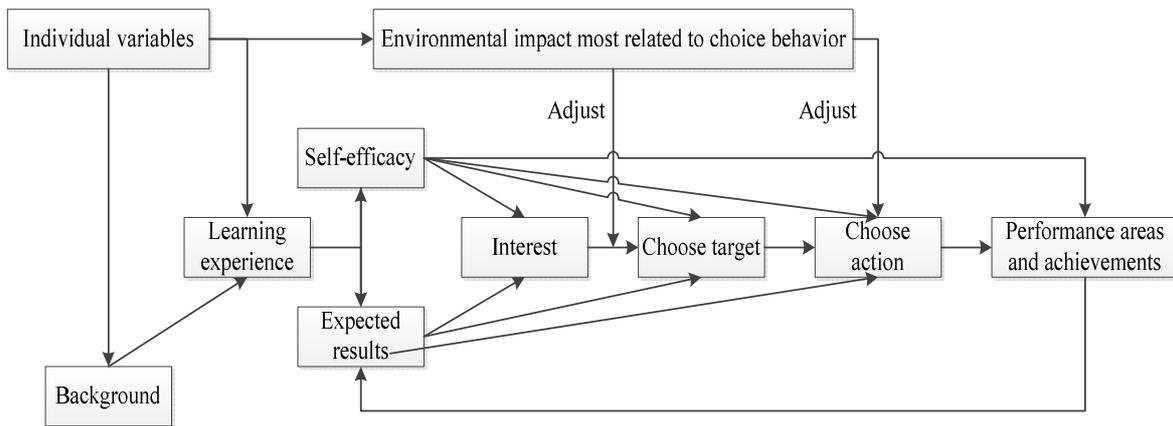
#### Career theory model of cognitive science

The career theory will be divided into four dimensions: career planning, career exploration, career decision-making and field information (Jarcho *et al.*, 2011; Del Missier *et al.*, 2012).

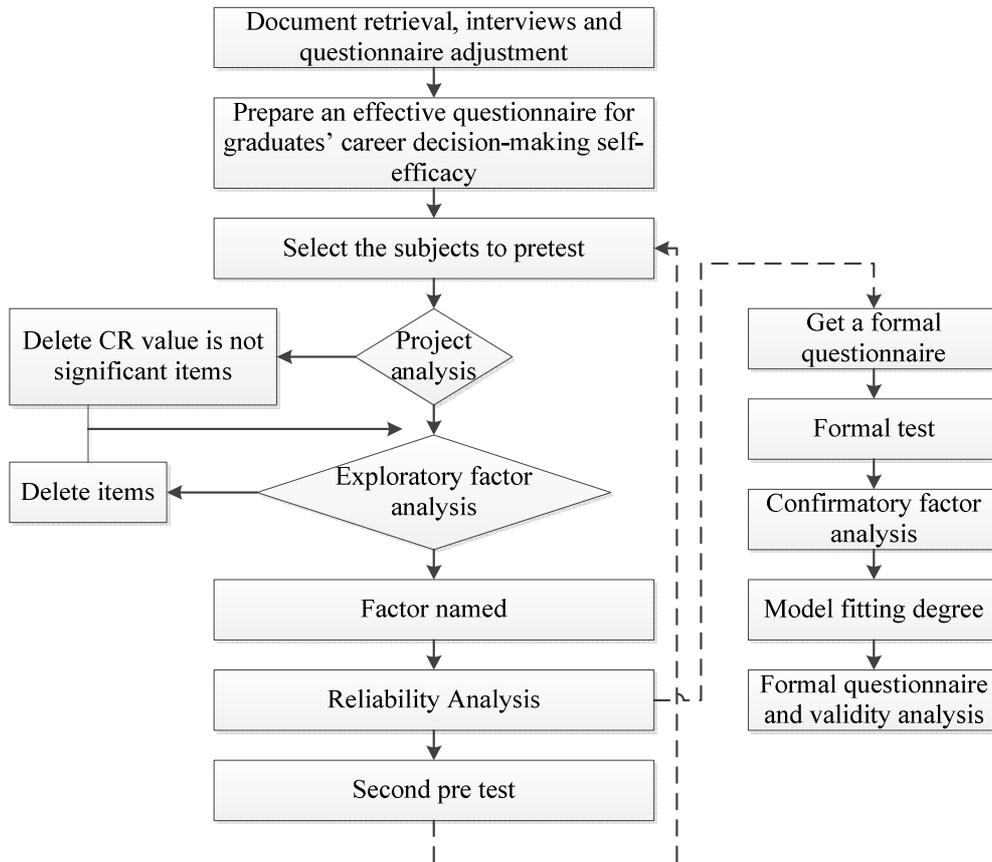


Figure 3 is a career theory model of cognitive science. The three core variables that influence career decision-making all show mutual adjustment relationship. Self-efficacy determines the outcome expectation of career choice, and organizes, guides and maintain his or her own behavior through the setting of personal goal planning. Figure 4 is the dimensional modeling process for the career decision-making structure

of college students. Through the previous literature search, interviews, and questionnaire surveys, an initial questionnaire on self-efficacy of career planning decision-making by college students is prepared. Subjects are selected for pre-testing, and formal analysis is performed after reliability analysis. The confirmatory factor analysis, model fitting degree and efficacy analysis are carried out on the survey results.



**Figure 3.** Career theory model of cognitive science



**Figure 4.** Dimensional modelling process of career decision-making structure by college students

## Investigation and research on career planning decision

### Research method

The experimental objects of this investigation are undergraduate graduates of the University, and 60 undergraduate graduates are recruited with payment for career planning decision-making group counseling, including 30 objects who accept career planning decision-making group counseling as an experimental group, and 30 objects who do not accept career planning decision-making group counseling as a control group. Career planning decision-making group counseling includes 24 items such as self-awareness, career orientation, and goal completion status. The investigation and research process is divided into three stages: preparation, intervention and evaluation. It designs the group counseling program, determines the evaluation tools, and formulates the career group counseling plan. The evaluation process consists of process evaluation, summary evaluation and follow-up evaluation, which take five months in total. The data obtained include Self-rating Scale for College Students, Career Decision Maturity Questionnaire, Career Group Counseling Summary Evaluation Table and Follow-up Evaluation Sheet.

### Research results and analysis

The effectiveness of intervention is evaluated by comparing the changes of score in career decision-making maturity between the experimental group and the control group before and after intervention. Table 1 shows that there are no significant differences in career planning, career planning attitude, career choice involvement and independence, orientation, certainty and compromise, self-evaluation ability, career planning and problem solving ability between the experimental group and the control group before the group intervention, showing the homogeneity. Table 2 compares the differences in terms of career planning, career planning attitude, career choice involvement and independence, orientation, certainty and compromise, and self-evaluation ability, career planning and problem solving ability between the experimental group and the control group. The results show that there are significance differences between two groups, that's, the scores of the experimental group are higher than those of the control group in all aspects, indicating that the group counseling could improve the maturity of experimental group significantly higher than the natural learning could improve the career maturity of control group.

**Table 1.** Pre-test difference between experimental group and control group

	Experimental group		Control group		t	p
	Mean	SD	Mean	SD		
Career planning	130.56	7.73	129.20	13.04	0.26	0.78
Career planning attitude	78.33	6.84	75.70	11.04	0.61	0.54
Career selection and independence	30.56	2.40	28.20	4.73	1.33	0.20
Occupational choice orientation	15.22	1.30	15.50	4.49	-0.16	0.86
Career choice determinism	16.45	3.50	16.0	3.50	0.23	0.80
Career choice compromise	12.78	2.74	12.70	1.54	0.08	0.92
Professional maturity	51.11	8.03	52.40	3.33	-0.45	0.64
Self-assessment ability	12.33	2.63	14.0	1.04	-1.66	0.10
Get professional information capabilities	13.22	2.24	14.20	2.94	-0.78	0.43
Career planning and problem solving skills	23.33	5.09	22.10	3.35	0.62	0.52

**Table 2.** Comparison of differences in measurement values before and after the experimental group and the control group

	Experimental group		Control group		t	p
	Mean	SD	Mean	SD		
Career planning	23.67	7.32	0.28	17.84	3.64	0
Career planning attitude	15.33	7.24	3.49	13.77	2.30	0.02
Career selection and independence	3.21	2.10	-0.49	3.91	2.52	0.02
Occupational choice orientation	5.10	2.10	0.69	7.84	1.61	0.11
Career choice determinism	4.43	4.47	1.59	3.02	1.63	0.11
Career choice compromise	2.66	2.11	1.69	3.01	0.79	0.43
Professional maturity	8.32	6.55	-3.19	6.33	3.89	0.00
Self-assessment ability	4.21	4.08	-0.29	1.94	3.12	0.01
Get professional information capabilities	0.88	2.46	-1.59	3.77	1.67	0.10
Career planning and problem solving skills	3.11	5.01	-1.29	3.55	2.17	0.03



**Table 3.** Comparison of post-test and follow-up differences in experimental group

	Experimental group		Control group		t	p
	Mean	SD	Mean	SD		
Career planning	154.33	7.19	151.22	8.74	2.05	0.06
Career planning attitude	93.78	5.61	89.78	5.29	2.43	0.02
Career selection and independence	33.78	2.46	33.11	2.43	0.78	0.39
Occupational choice orientation	20.33	2.23	19.67	3.14	0.48	0.63
Career choice determinism	19.89	2.18	20.11	2.06	1.20	0.25
Career choice compromise	15.45	1.66	13.56	2.58	1.79	0.11
Professional maturity	59.45	3.21	60.33	4.34	-1.07	0.30
Self-assessment ability	16.56	2.17	17.45	1.98	-2.18	0.04
Get professional information capabilities	14.11	2.84	14.78	2.79	-0.68	0.49
Career planning and problem solving skills	26.56	1.57	26.99	2.44	0.71	0.48

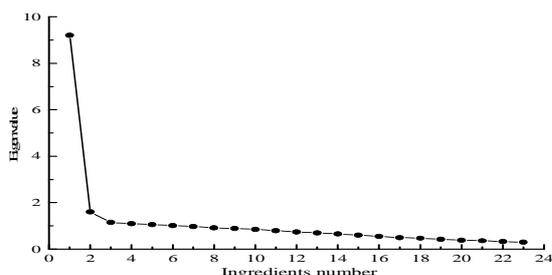
**Table 4.** Comparison of pre-test and follow-up differences in experimental group

	Experimental group		Control group		t	p
	Mean	SD	Mean	SD		
Career planning	130.56	7.73	151.22	8.74	-8.01	0.00
Career planning attitude	78.33	6.84	89.78	5.29	-5.16	0.00
Career selection and independence	30.56	2.49	33.11	2.43	-3.83	0.00
Occupational choice orientation	15.22	1.30	19.67	3.14	-4.60	0.00
Career choice determinism	16.45	4.50	20.11	2.06	-2.50	0.02
Career choice compromise	12.78	2.74	13.56	2.58	-0.76	0.45
Professional maturity	51.11	8.03	60.33	4.34	-4.01	0.00
Self-assessment ability	12.33	2.63	17.45	1.98	-3.97	0.00
Get professional information capabilities	13.22	2.24	14.78	2.79	-2.07	0.06
Career planning and problem solving skills	23.33	5.09	26.99	2.44	-1.98	0.07

Table 3 is the comparison of the difference between the pre-and post-test and follow-up of the experimental group. After 5 months of group counseling, the follow-up evaluation is carried out. It is obvious that there is no significant difference between the post-test and follow-up scores of the experimental group. Table 4 compares the difference between pre-test and follow-up of the experimental group. Its scores of pre-test and five months after intervention show significant differences in all aspects, and the scores of all items are higher than those of pre-intervention, indicating that group counseling has long-term effectiveness in improving career planning decision-making of college students.

### Analysis of college students' career planning decision-making scale

#### Analysis of career planning decision-making scale



**Figure 5.** Scree plot of initial measurement data of career decision-making self-efficacy

Compared with the homogeneous control group, the experimental group and the control group show different scores in career efficacy before and after group counseling intervention. In order to analyze the influencing factors, this paper adopts the scree plot analysis method. Scree plot is used to represent a slope line of the number of factors and the score of the eigenvalue. When drawing, the eigenvalues of the principal components are ranked from high to low, and when the feature value is greater than 1, it's the principal component. Figure 5 is a scree plot of initial measurement data of the Career Decision Self-efficacy Scale. It can be seen that there are three factors whose eigenvalue is greater than 1. The eigenvalues of the three factors are 9.223, 1.524 and 1.215 respectively. The eigenvalue of the first factor is much greater than that of other factors. Figure 6 is the scree plot of desired career outcomes, and it is evident that besides the first factor, the slope of other factors is flat, and then only Factor 1 is remained. Figure 7 is the scree plot of initial measurement data of the Career Development Attitude Scale. The eigenvalues of the first four factors are greater than 1, and the slope line is gentle from the fifth data, thus taking the first four factors. The orthogonal rotation comparison between the results of principal component analysis in Figure 7 and the maximum variation method shows that there is a difference



between the division of principal factors and the original scale.

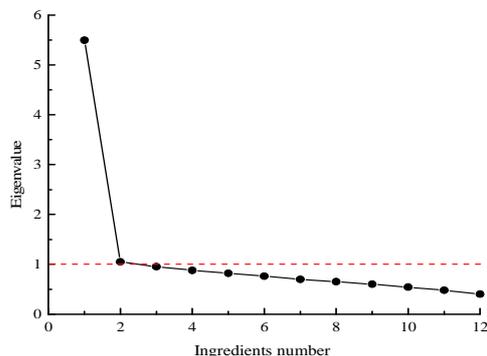


Figure 6. Scree plot of desired career planning results

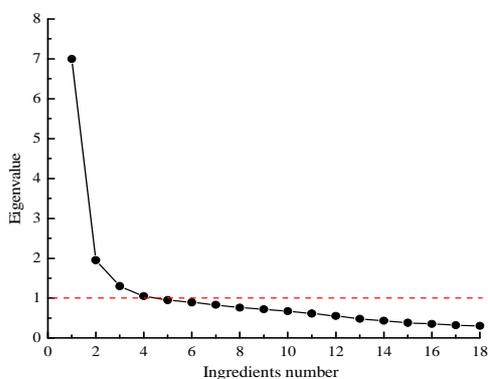


Figure 7. Scree plot of initial test data of career development attitude scale

### Effective application of cognitive science theory

Cognitive science theory belongs to the normative career decision-making theory. Group counseling intervention can significantly improve college students' career planning decision-making and has a long-term effect on improving college students' career maturity. The analysis of cognitive science theory shows that the ultimate goal of career planning decision-making is to improve the ability of career decision-makers through scientific information processing ability. Cognitive science theory integrates the skills of communication, analysis, synthesis, evaluation and execution of species information processing, and improves college students' skills of career planning and career decision-making from different perspectives and stages. The above analysis shows that the career group counseling plan designed according to the cognitive science theory is a feasible and effective implementation plan of career counseling. The cognitive science theory can be applied to the group counseling intervention study of career maturity, and plays a

vital role in improving the career maturity of college students. From the perspective of environment, college students' life, learning environment and career expectation will affect their career planning decision-making. The higher the career expectation is, the stronger the goal and motivation they show, so as to improve their own career awareness and career planning ability.

### Conclusions

Based on the theory of cognitive science, this paper studies the career decision-making and career planning of contemporary college students to promote the integration of career decision-making and cognitive science theory. The concrete conclusions are as follows:

The factors determining career decision-making of college students are divided into external factors and internal factors. The controllability of internal factors is higher than that of external factors. Career decision-making should emphasize the relationship between human and information, and human and value, and realize the compatibility and accessibility of career expectation through the cognition of individuals and career matching.

In career planning decision-making, there are significant differences in career planning, career planning attitude, career choice involvement and independence, orientation, certainty and compromise, as well as self-evaluation ability, career planning and problem solving ability and so on after group counseling intervention.

There are few principal factors affecting the effectiveness of career decision-making, and the division of principal components is different from the original scale. The experimental analysis of this paper shows that cognitive science theory can be well applied to the career planning decision-making of college students.

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