A Comparative Study on the Difficulty about Mathematical Examination of Entrance for College in China (Volume A) and (Volume B) in 2021

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Abstract: Based on the relevant theories of the comprehensive model about difficulty, this study compares and analyzes the difficulty of mathematical examination of entrance for college in China volume A and volume B in 2021 from nine factors: cognition,background,operation, reasoning, knowledge, analyzing data, thinking direction, parameter, and problem solving methods, The research found that there were significant differences in cognitive level and content of knowledge between them; mathematical examination of entrance for college in China (volume A) and (volume B) are both too many to check the level of cognition; There are differences in individual factors for difficulty between them. In this regard, the following suggestions are made in the preparation for mathematical examination of entrance for college in China:

①Strengthen orientation towards the goal and integration of conception for value ；

②Focus on the orientation towards problem of positive thinking and reverse thinking；

③Adhere to the orientation towards results of reasonable structure and moderate difficulty.

Keywords: Comprehensive Coefficient About Difficulty; Comparative Analysis

1. Introduction

As the basis of talent selection in China, mathematical examination of entrance for college in China is the most authoritative, persuasive and leading educational evaluation.(Wang Yani, Mi Pengli, Gong Kaiwei, 2021). With the continuous development of the times, examination of entrance for college in China shows a trend from diversification to unification.(Liu Haifeng 2016).

In 2014, the *Opinions about Implementation of the State Council on Deepening the Reform of the Examination and Enrollment System* marked the comprehensive launch of a new round of examination and enrollment system reforming, (The State Council of the People's Republic of China,2014) and led to the continuous promotion and reform of Chinese examination of entrance for college. In 2019, *the Guiding Opinions of the General Office of the State Council on Promoting the Reform of the Way of Education in Ordinary High Schools in the New Era* emphasized that the difficulty of the tested questions should be set scientifically and reasonably, in line with the standards for curriculum and the actual situation of students. (General Office of the State Council,2019) Subsequently, *the general outline of the 2019 National Unified Examination Program for Enrollment of Ordinary Colleges and Universities* also clearly stated that mathematical examination of entrance for college in China should have appropriate difficulty. (Li Baozhen,2020) The difficulty of tested paper has always been a hot topic discussed by researchers, and the comprehensive model for difficulty is one of the important tools to study the difficulty of tested papers. This model originated from a work report submitted by Nohara, a scholar, to the National Center for Education Statistics of the United States, which first proposed the concept of overall difficulty. (Xue Huan,2020) In 2002, Chinese scholar Bao Jiansheng put forward a comprehensive model for difficulty on

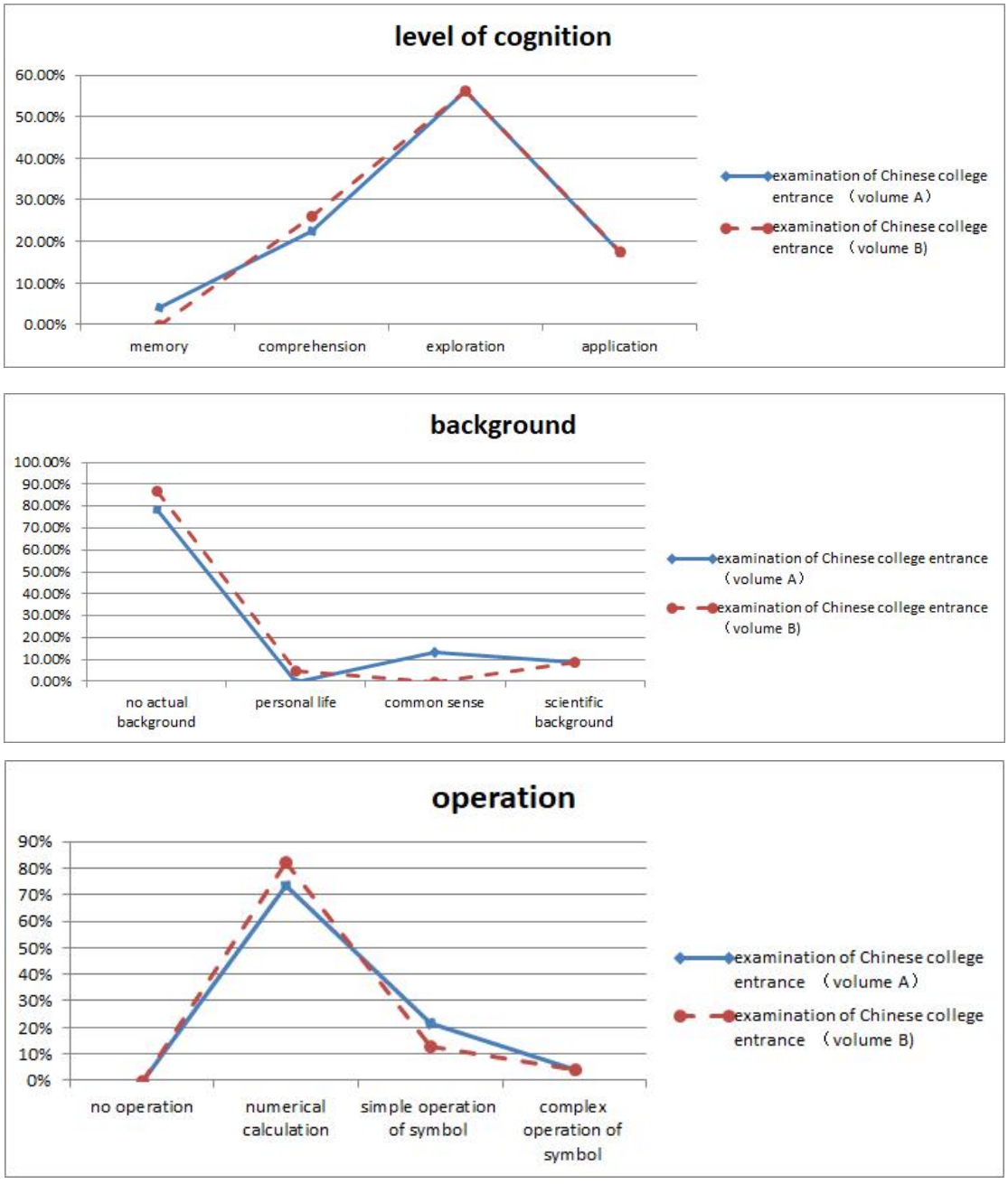
the evaluation of mathematical exercises based on the overall difficulty(Bao Jiansheng,2002).

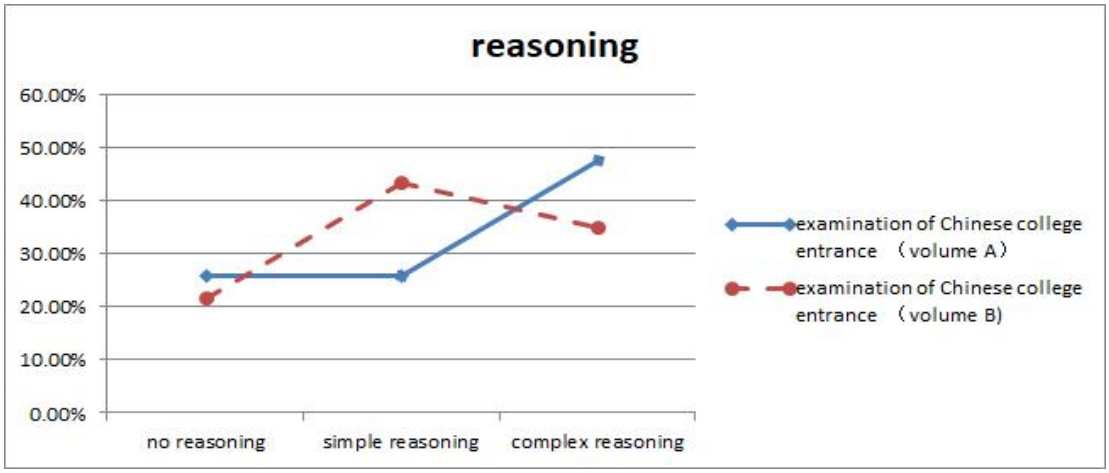
2. Research

Coefficient about the difficulty of these eight factors d_i (i=1, 2, 3, 4, 5, 6, 7,8,9),The method of calculation is shown in the following formula：

$$d_i = \frac{\sum_j n_{ij} d_{ij}}{n} (\sum n_{ij} = n; i = 1,2... j = 1,2...)$$

3. Results

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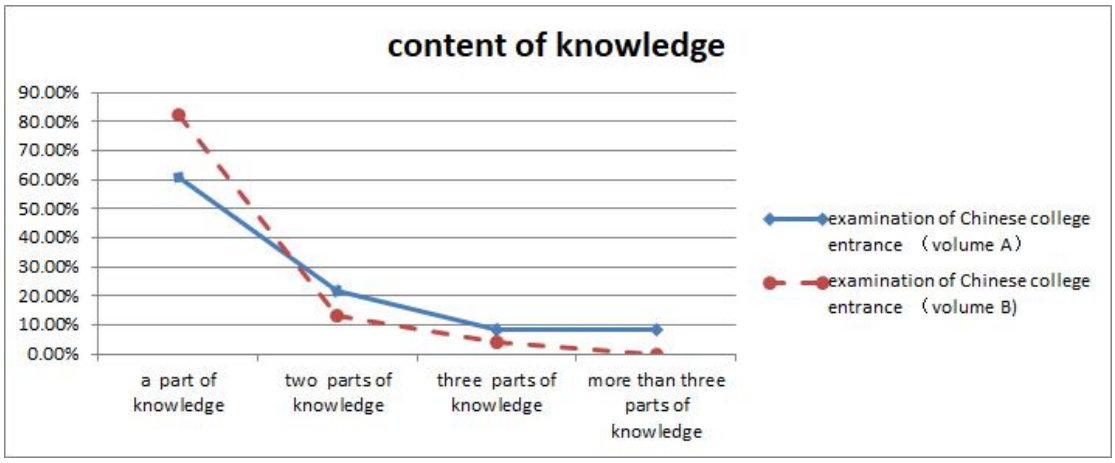
examination of Chinese college entrance （volume B)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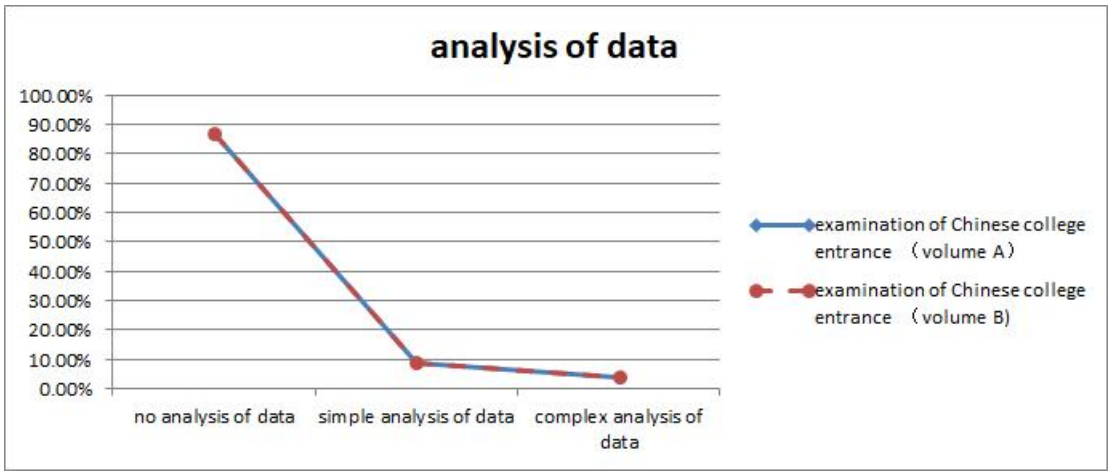
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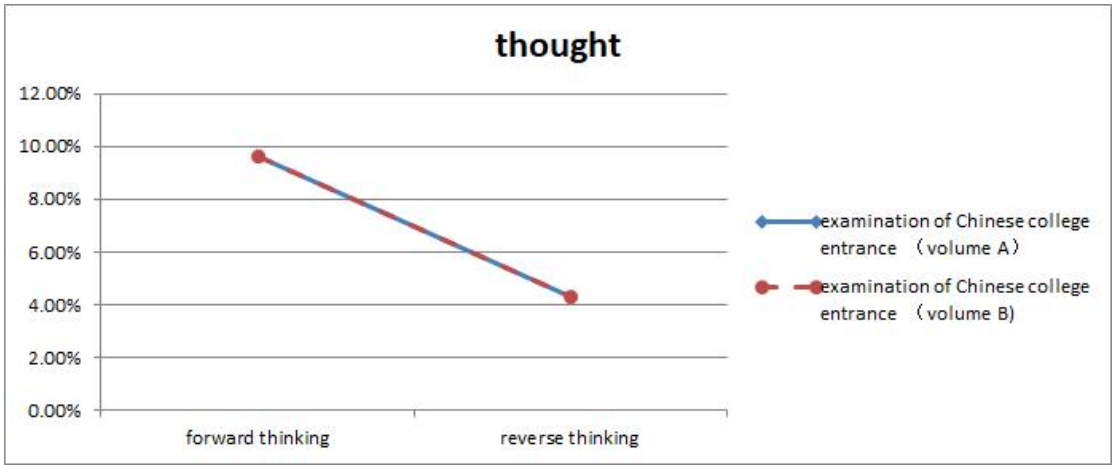
examination of Chinese college entrance （volume A）
examination of Chinese college entrance （volume B)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examination of Chinese college entrance （volume A）
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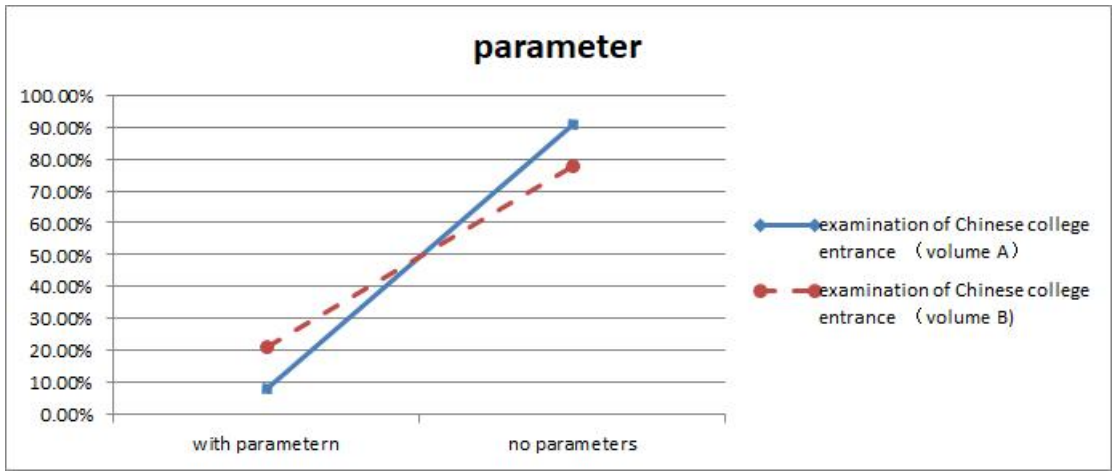
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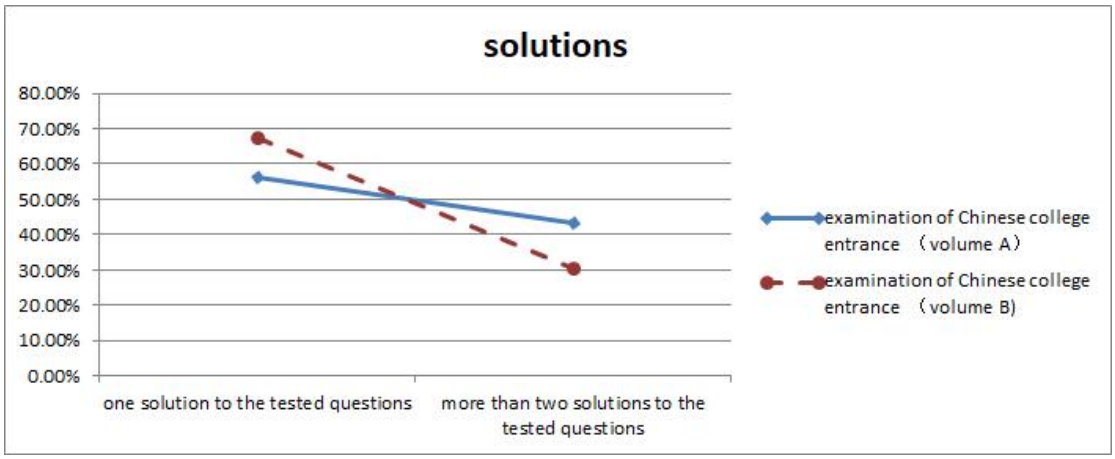
examination of Chinese college entrance （volume A）
examination of Chinese college entrance （volume B)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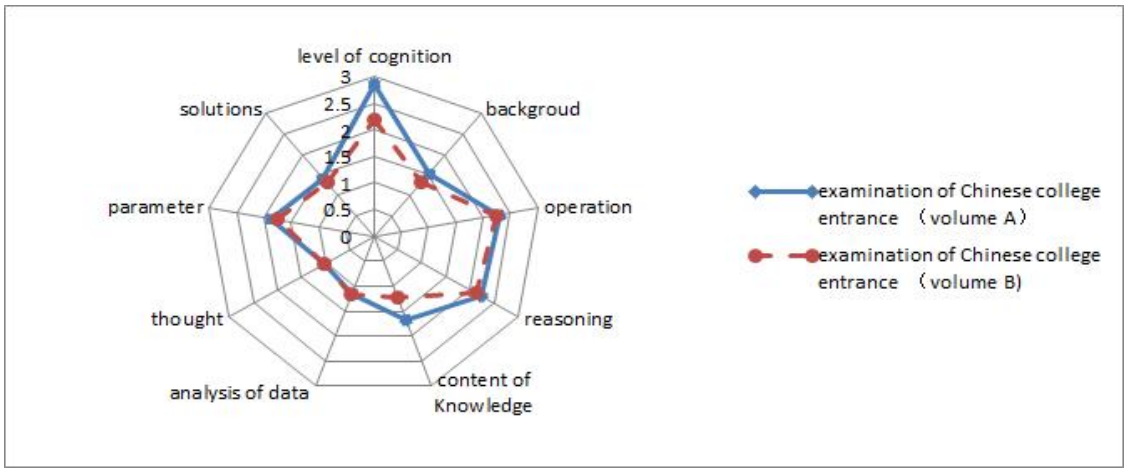
more than two solutions to the tested questions
examination of Chinese college entrance （volume A）
examination of Chinese college entrance （volume B)



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