

An Exploring Model of Intelligence and Personality in Different Culture

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Abstract: Middle school subjects of 13-21years (from 4 nationalities) were used for studying the relationship between progressive cognition and personality characteristics by Raven's Standard Progressive Matrices and Eysenk's Personality Questionnaire. The results showed: (1) the correlation and stepwise regression were completely identical: P score was negatively related to progressive cognition; E score was positively related to progressive cognition. (2) With the personality characteristics and the personal variables as independent variables, the stepwise regression indicated: E score was the most predictors of progressive cognition, and then was nation, culture degree of mother and father, P, age, sex, mathematics and language achievements.

Key words: intelligence personality cross-culture

1. Introduction

In China, the cross-culture psychology began in 1970's. In the past twenty years, the psychological researchers have explored the cognition and intelligence developmental traits of various nations, but the quantitative studies were very few. At the same time, there were few studies about personality characteristics of minority college students. Shi and Liu (1993) compared college students' personalities between Mongol and Han nationality, Tao and Liu (1996) contrasted them among Mongol, Hui, Tu and Han nationality. In addition, some personality researches existed under bilingual educational patterns in the same nation, which found differences in personality among various nations or different language settings in the same nation. These results provided psychological evidences for national education, and accumulated data for cross-culture research of national psychology. The present study is to adapt to the change of educational system, which is from exam-oriented teaching to quality-oriented teaching in order to promote full-scale development of each national young people and teenagers.

The present paper is based on Eysenk's Extroversion and Arousal theory (1967, 1985). To verify Eysenk's theory, many scholars adopted EPQ to discuss the relationship between personality and cognition, personality and arousal. Matthew (1993) found it was the qualitative difference in cognition tasks and arousal between extroversion and introversion. Xu and Wu (2000) reported extroversion could predict negatively the name recall, picture recognition and problem solving. Zheng (1999) who studied the relationships between personality and intelligence of children addressed that during the children's growth, the development of intelligence and intro-extroversion positively related, in contrast with emotional stability. Intelligence and personality are very important in the individual different field, but existing researches limited a few sample

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subjects, and should further study whether the previous results could extend other nationalities in order to reveal the relation explicitly.

2. Method

2.1 Subjects

An initial pool of 400 subjects who took the EPQ and SPM was reduced to 389 subjects of 14-20-years-old by eliminating missing completing ones. The analysis was concluded on Hans (190 including male and female the follow as same), Kazaks (41), Huis (107) and Bais (51).

2.2 Test Instrument

2.2.1 Raven's Standard Progressive Martices. It is best known and most widely used of all culture-reduced tests (Raven, 2000). The SPM consists of 60 items, 12 items from each of five categories: "a" category is to test perception identification, picture comparison and imagination; "b" is similarly contrast; "c" is comparing, reasoning and picture combination; "d" tests sequence relation and picture padding; "e" tests padding and exchanging. Tests are made up of series of diagrams or designs with a part missing. Those taking the tests are expected to select the correct part to complete the designs from a number of options printed beneath.

2.2.2 Eysenk's Personality Questionnaire. It is revised by Gong; and is composed of four factors: introversion-extraversion, psychoticism, neuroticism and lying dimension.

2.2.3 Demographics factors investigation, including subject's nationality, grade, sex, age, the latest Chinese and mathematics scores, parents' occupation and education degree.

2.3 Procedure

Subjects are first requested to do the demographics factors questions, then the EPQ and SPM without any time limitation, but generally from one hour to eighty minutes. All students appeared high motivated. The instructions recommended students to wait quietly in classroom if they have finished before one hour.

3. Results

3.1 Anova Analysis

In the whole sample personality's Anova analysis, P ($F(3, 3) = 53.623, p < 0.01$), E ($F(3, 3) = 133.753, p < 0.01$) and L ($F(3, 3) = 18.932, p < 0.01$) scores of Han, Kazak, Hui and Bai nationality existed a significant difference. In various nations' Anova analysis, two personality traits of Han-Hui and Han-Bai showed a significant difference, and three personality traits were different in Kazak-Hui and Kazak-Bai (see table 1).

In the whole sample reasoning cognition Anova analysis, four nationalities obtained significant differences in a, b, c, d, e scores ($F_a(3,3) = 1009.613, F_b(3,3) = 617.683, F_c(3,3) = 400.808, F_d(3,3) = 334.794, F_e(3,3) = 133.753, p < 0.01$). Post-hoc test showed, on the five cognition indexes, Han-Hui, Han-Bai, Kazak-Hui and kazak-Bai were different significantly from each other (see table 2).

Table 1 Post-Hoc Comparison in Anova of Personality Characteristics among Different Nationalities (Md Value)

	P	E	N	L	
Han- Kazak	-.17	.74	1.76	-3.14**	
Han-Hui	-4.20**	6.25**	.17	.18	
Han-Bai	-4.92**	6.35**	.56	-.49	
Kazak- Hui	-4.03**	5.50**	1.58	3.59**	
Kazak- Bai	-4.75**	5.61**	-1.20	2.92**	
Hui-Bai	-.72	.10	.39	-.67	

Attention: *P<0.05 **P<0.01 (the follow as same)

Table 2 Post-Hoc Comparison in Anova of Progressive Cognition among Different Nationalities (Md Value)

	a	b	c	d	e
Han-Kazak	-3.75E-02	.50	1.11*	1.15	.74
Han-Hui	10.59**	10.01**	8.65**	7.76**	6.37**
Han-Bai	10.60**	10.08**	9.19**	7.45**	6.27**
Kazak-Hui	10.63**	9.51**	7.54**	6.61**	5.63**
Kazak-Bai	10.64**	9.58**	8.08**	6.29**	5.53**
Hui-Bai	-8.43E-03	7.11E-02	.54	-.32	-9.68E-02

3.2 Stepwise Regression Of The Relationship Between Reasoning Cognition And Personality

The stepwise regression regarded four personality traits as the independent variables, and five cognitive reasoning indexes as dependent variables. Table 3 showed P scores negatively related to four cognitive indexes, E scores positively related to five indexes. With the increase of item difficulty, the former's coefficient reduced gradually, the latter contrasted. Table 4 showed, Han's E scores are positively related to 5 indexes, P scores are negatively affected 3 indexes, and Kazak's E scores identify with Han's. Positive relevance exists in Hui's L and d, E and e, Bai's E and e.

Table 3 Stepwise Regressions of the Relationship between Reasoning Cognition and Personality in Whole Sample

	a	b	c	d	e
P	-.275**	-.261**	-.214**	-.176**	
E	.661**	.698**	.757**	.811**	.993**
N			.056*		
L					

Table 4 Stepwise Regressions of the Relationship between Reasoning Cognition and Personality in Various Samples

	a	b	c	d	e
Han	E**(.414)	E**(.516)	E**(.670)	E**(.752)	E**(.1000)
	P**(-.143)	P**(-.183)	P**(-.120)		
Kazak	E**(.575)	E**(.655)	E**(.678)	E**(.763)	E**(.1000)
Hui			E**(.1000)		
Bai					

Table 5 Stepwise Regressions in Whole Sample Adding Personal Demographics Variables

	a	b	c	d	e
nation**	E**	E**	E**	E**	E**
(-.453)	(.398)	(.158)	(.612)	(1.000)	
E**	nation**	nation**	nation**		
(.285)	(-.340)	(-.135)	(-.247)		
mw**	mw**	mw**	mw**		
(.246)	(.249)	(.203)	(.154)		
fw**	P**	fw**	P**		

(-.125)	(-.104)	(-.101)	(-.073)
P**	fw**	P**	fw**
(-.094)	(-.097)	(-.069)	(-.076)
nl*	sx**	nl*	xb**
(.068)	(-.091)	(.056)	(.058)
sx**	yw*		nj*
(-.066)	(.067)		(.049)
yw*			
(.056)			

Table 6 Multi-Stepwise Regressions in Various Sample Adding Personal Demographics Variables

	a	b	c	d	e
Han	E** (.510)	E**(.516)	E**(.670)	E**(.786)	E** (1.000)
	P*(-.152)	mw**(.174)	xb**(.144)		
	nl*(-.165)	P**(-.173)	mw* (.116)		
Kazak	nj** (.655)	yw**(.382)	E**(.678)	E** (.607)	E**(1.000)
	E**(.356)	E**(.406)	nj** (.341)		
			xb*(.227)	mw* (.229)	
Hui			mz*(-.223)	E**(1.000)	
			L*(.208)		
Bai			fz*(.297)	E**(1.000)	

3.3 Multi-stepwise regression analysis among reasoning cognition, demographics factors and personality traits

This regression took the demographics factors and personality traits as independent variables, and 5 reasoning cognitive indexes as dependent variables. Table 5 showed E, nation, parents' education degree and occupation, age, performance achievement and gender could predict 5 cognitive indexes. The prediction dropped from up to down. Table 6 showed that Han's progressive cognition was predicted by E, P, mother's education degree, gender and age. The Kazak's was predicted by E, grade, Chinese performance, and gender. The Hui's was predicted by E, and mother's occupation. The Bai's was predicted by E and father's occupation (see table 6) .

4. Discussion

4.1 Summary of Findings

From table 1 and table 2, we can assume that personality P、E influences progressive cognition. In table 1, we can see the significant difference among personality P, E, L, but consistency in N. On P score, The Bais got the highest score, then was the Huis, Kazaks and Hans, what's more, the difference mainly existed between Han-Hui, Han-Bai, Kazak-Hui and Kazak-Bai. On E score, the Hans got the highest score, and then Kazaks, Huis and Bais, and primary difference appeared in Han-Hui, Han-Bai, Kazak-Hui and Kazak-Bai. In respect of the progressive cognition (see table 2), there were differences among various nations. Han-Hui, Han-Bai, Kazak-Hui and Kazak-Bai indicated differences, and the former two achieved higher scores than the latter. Table 1 and table 2 revealed the difference of personality P, E among Han-Hui, Han-Bai, Kazak-Hui and Kazak-Bai, also occurred in progressive cognition. Thus we made the supposed-personality P, E play an important role in progressive cognition. This can be testified in the regression, which showed P predicted progressive cognition negatively, but E contrasted.

When the personality and personal demographics factors regarded as the progressive cognitions' variables,

only E, P entered the regressive equation; others were nationalities, culture, mathematic and Chinese achievements, age and parents' occupation.

The Hans and Kazaks introversion-extroversion affected their progressive cognition, and the two nations' extroversions was higher, because the Kazaks make living based on herd raising and the Hans locate in opening regions which have high level civilization, at the same time the progressive cognition was influenced by age and Chinese achievement which was consistent with Chen and Zheng's result. Individuals less affected by modernization intended inaccurate and slow spatial cognition manipulation, and related to schooling because spatial reasoning ability is the content of school, different educational quality give rise to different spatial ability. As far as we concerned, school should increase students' progressive cognition in the Han and Kazak starting with introversion-extroversion and schooling. In addition, it has another approach for the Hans to improve the mothers' education degree. Han's students' observation, comparison, imagination, analogy and combined ability were impacted by psychoticism, while the Han, Hui and Bai were unaffected because of the different culture and cognitive style. The Huis and Bais progressive cognition was related to introversion-extroversion, parents' education degree and age, especially father's occupation of the Bais had an effect on observation, comparison, imagination and combined ability, otherwise education restricts occupation, therefore we have to improve education degree of the Huis' and Bais' parents.

4.2 Culture Affecting Personality Characteristics and Progressive Cognition

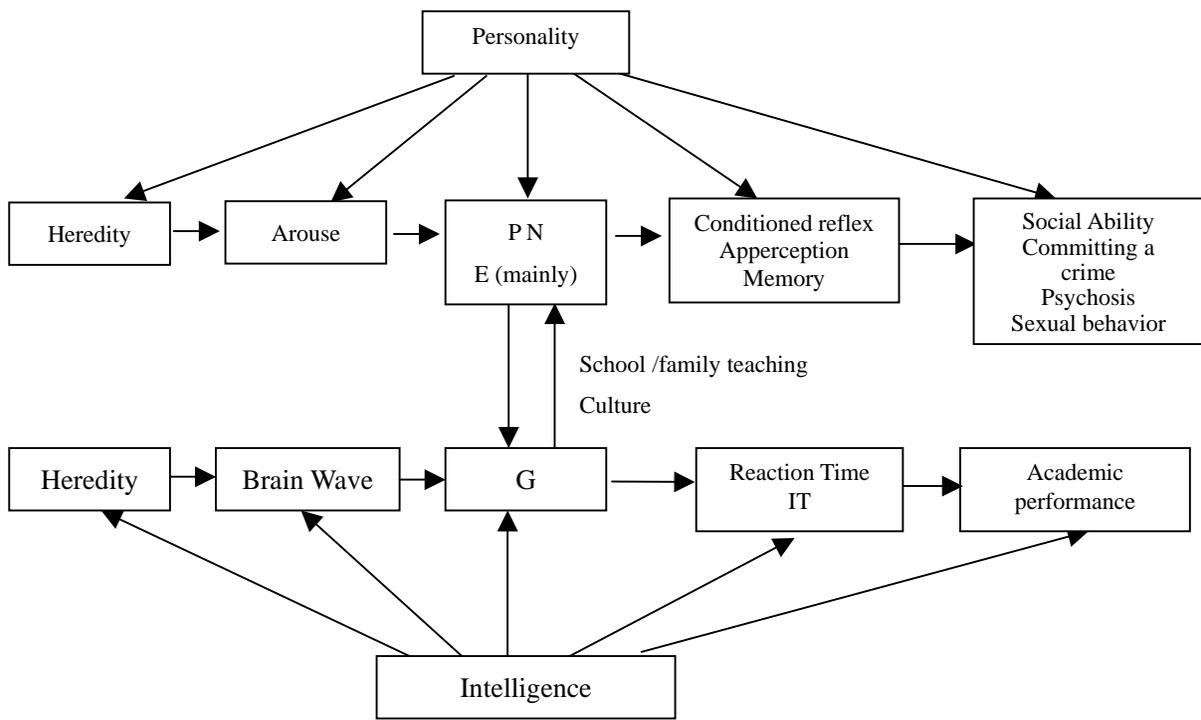
However the school and family teaching, parents' occupation and education degree, or other factors are all affected by nationality culture, so nationality culture plays an important role in the personality characteristics and progressive cognition. Cultural anthropology theory argues that culture includes three aspects: substantial, institutional and mental, among which substantial aspect is the surface layer, tasting sentiment, value concept, moral criterion, religion belief, thinking style and so on are the deep ones, in the middle are sorts of systems and theories. The Hans and other minorities all expose to the Hans' culture, only the degree and amount are different, thus each has own national psychology. The Kazaks' culture stems from original mythology and magnificent rare original image, the mythology similiarity between Han and Kazak results in the comparability of mental culture. In the present study the comparison between personality and progressive cognition in Hans and Kazaks didn't show any difference. The Hui's culture integrating Chinese and foreign countries' culture is the combination of Han's and Islamic culture (which is the core). BenZhu's culture is the soul of the Bai's culture. The characteristic of Hui's and Bai's culture lies in the content so that it leads to the similar personality and intelligent aspects between the two nations' students. The mental traits of four national students differ in detail, because of mainstream culture and subculture.

4.3 Predicting the Relationship Model between Personality Characteristics and Progressive Cognition

In our research we can conclude that personality and progressive cognition influence one another, but not cause and effect relation, also supported by the individual mental development. Progressive cognition is the core of intelligence, and now there is not a good test to measure the nature of intelligence. In the case Raven's standard progressive Martices provide a good measure of the psychometric g. In foreign countries, there are many studies on the intelligence and personality, but mainly in the way of questionnaire survey. Because their influential factors are so many, it's hard to control accurately. The empirical studies are reviewed in the following: Firstly, directly compare the personality and intelligence. It has been proposed that personality (in the narrow sense) and intelligence are uncorrelated and essentially independent (Eysenck, H. J.). Secondly, adding mediators: trait anxiety, stress, menstrual cycle (Kumari, Veena, *et al*, 1998) academic performance (Rindermann, Heiner *et*

al,2001; Furnham, Adrian,2002), IT, self-attribution of ability, processing speed, working memory, self-monitoring, self-handicap, self-evaluation, self-motivation, self-efficacy, locus of control (Braden, 1995), self-concept, self-esteem and self-confidence. It is suggested that the link between extroversion level and ability/intelligence test score be likely to be fragile and inconsistent at best. In addition, there is the physical mechanism research, for example cortex activity (Razoumnikova, Olga, 2003 ;), which pointed to important moderating role of personality and intelligence.

Although the interest in the relationship between personality and psychometric intelligence may reflect an attempt to provide sound empirical evidence for the integration of fundamental ability and notability traits, only a few researchers (e.g. Ackerman, 1996a, 1996b, 1997) have attempted to providing a theoretical framework for integrating and explaining the results of either experimental or psychometric investigations. Furthermore, there are few models or theories that attempt to describe the processes or mechanisms by which personality traits may affect intelligence test performance/outcome (Zeidner, 1995, 1998). The present paper presents a possible conceptual model for the integration of personality traits and intelligence.



Predicted Model of Personality and Intelligence

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