



Determination and Correlation Analysis of Mental Health Influencing Factors Among Ant Tribe Young Intellectuals Based on Cognitive Neuroscience

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ABSTRACT

This paper aims to identify the main influencing factors of the mental health of ant tribe young intellectuals (ATYIs) and ascertain those factors in favor of mental health. Based on the research findings in cognitive neuroscience, the author explored the main factors affecting the mental health of the ATYIs through a questionnaire survey on 904 youngsters graduated in the past five years. The questionnaire evaluates the overall mental health of the respondents with four psychological test scales, namely Positive PsyCap Questionnaire (PPQ), Symptom Checklist 90 (SCL-90), Adult Dispositional Hope Scale (ADHS), and Perceived Stress Scale (PSS). Through the analysis, it is concluded that family income, academic performance, and interpersonal relationship are the main influencing factors of the mental health among the ATYIs. The research finding provides a reference for mental health education in colleges and points the direction for the ATYIs to improve their mental health.

Key Words: Cognitive Neuroscience; Ant Tribe Young Intellectuals (Atyis), Influencing Factors of Mental Health

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Introduction

Recent years has witnessed a continuous growth in the number of college graduates in China. The number is expected to reach 8.2 million in 2018 (Source: ASKCI Consulting). After entering the workforce, many college graduates become the so-called "ant tribe young intellectuals" (ATYIs), i.e. "a group of low-income university graduates". The term was coined by Prof Lian (2015) of University of International Business and Economics. By definition, the ATYIs are well-educated, low-paid young people living in a compact community. In addition to the low income and poor living conditions, the ATYIs are faced with poor social security and enormous pressures from the society and families.

Unsurprisingly, their mental health is generally poorer than the social average level (Hu, 2017).

With the continuous development of education in China, the number of the ATYIs is continuously on the rise. This emerging group of youngsters, as the main force of social construction, directly bears on the future of the country (Tiemens and Ormel, 1996). Thus, the mental health of the ATYIs is a major determinant of social stability. It is an urgent task to understand their mental health and pinpoint the main influencing factors on the issue.

Despite the recent boom of "ant tribe" research, the ATYIs has been basically neglected by academic attentions. There is virtually no in-depth and comprehensive analysis on the mental health of the ATYIs.

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Psychologists have long been expanding their focus on behavioral pattern to cognitive pattern (Funk and Gazzaniga, 2009), as the latter has an impact on the generation of behaviors. In essence, the mental state of the ATYIs is a reaction of brain cells to external stimuli (Chen *et al.*, 2011). The brain cells are capable of making scientific and rational response to various external stimuli (Turk *et al.*, 2004). The reaction is a silence cognitive process, which externalizes itself in the behaviors of the ATYIs. Studies have shown that, once the cognitive mapping is established in the brain, cognitive activities will activate he brain cells, induce the brain potential, and stimulate the conduction of brain nerves, so that the brain will allocate resources to create emotions and brain images (Source: Journal of Cognitive Neuroscience). In return, the above process will influence the daily behaviors of the ATYIs (Chen, 2004).

Then comes the question: is the mental health of the ATYIs affected by environmental factors? The answer is affirmative (Dalkiran, 2017). Earlier studies have revealed the impact of environmental factors on some social behaviors (Zhang, 2010). For instance, those abused in childhood are 50% more likely to commit crimes. However, not every victim of child abuse possesses the tendencies to violence or crime. The result depends heavily on the specific genetic background, discovered that the expression of monoamine oxidase A (MAOA) gene moderates the impact of childhood abuse on the propensity for violence: for victims of child abuse, the level of MAOA expression is negatively correlated with the occurrence of violence tendency in early adulthood (Michael and Gazzaniga, 2013). It can be seen that genetic and environmental variables have an impact on the behaviors induced by the

variating chemical components in the brain. Thus, both the mental health and social behaviors of the ATYIs are affected by physiological cognition (Cai, 2015).

In light of the above, this paper attempts to answer two questions: (1) What are the main factors influencing the mental health of the ATYIs; (2) Which conditions are favorable for the mental health of the ATYIs? To find the answers, the author prepared a 11-item questionnaire, covering population, social and environmental factors, and collected the basic information of the respondents through the questionnaire survey. For the sake of objectiveness and comprehensiveness, four psychological test scales were adopted to evaluate the mental health of the respondents, including the Positive PsyCap Questionnaire (PPQ), Symptom Checklist 90 (SCL-90), Adult Dispositional Hope Scale (ADHS), and Perceived Stress Scale (PSS). On this basis, the main factors affecting the mental health of the ATYIs were discussed in details. The research framework is shown in Figure 1.

Methods

Sampling

Studies the questionnaire involves the questions on the background information of the respondents and four psychological test scales. To eliminate interference of human factors and protect the privacy of the researcher, a total of 1,013 questionnaires was prepared on wjx.com, and issued online to those graduated from colleges across China in the past five years. In the end, 904 (89.2%) valid questionnaires were returned. The data were collected with the consent of the respondents and kept confidential.

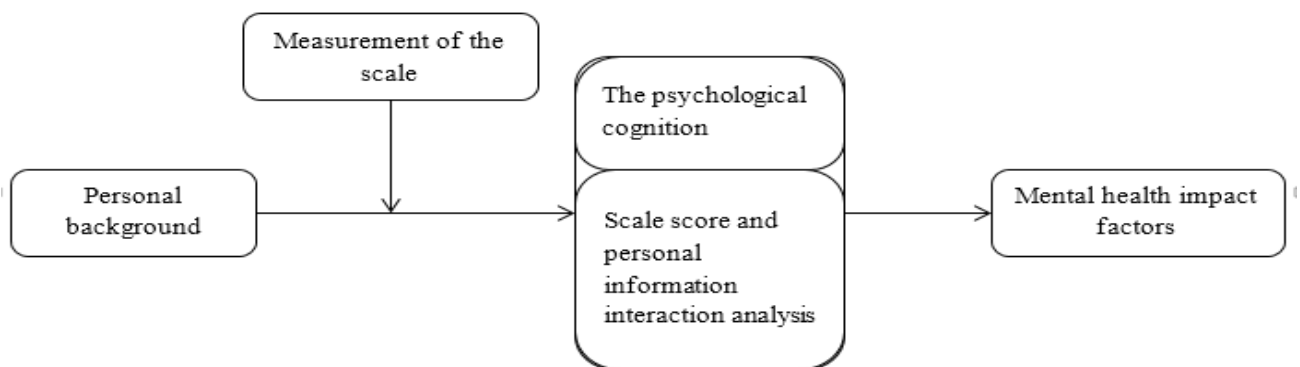


Figure 1. Research framework

Variable Measurement

Four widely accepted psychological test scales were employed to evaluate the mental health of the respondents.

PPQ

The PPQ is a 26-item test scale that measures the positiveness and optimism (e.g. “many people appreciate my talent”, and “I am not easily provoked.”). The items are rated against a 7-point Likert scale (1=strongly disagree; 7=strongly agree). The rating is positively correlated with the level of optimism. Here, the PPQ has a high degree of confidence of 0.927.

SCL-90

The SCL-90, created by Derogatis in 1975, is a multidimensional scale of 90 items in the following 10 dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and others. The scale weighs the mental symptoms of the respondents from ten aspects, ranging from feelings, emotions, thoughts, mentality, behaviors, habits, interpersonal relationships, diets to sleep. The items are rated between 1 (no symptom) and 5 (severe symptom). The rating is positively correlated with the presence of mental symptoms. Here, the SCL-90 has a high degree of confidence of 0.983.

ADHS

The ADHS is a 12-item scale that measures the satisfaction with life of the respondents (e.g. “I can think of many ways to get out of the trouble.”). The items are rated between 1 (absolutely incorrect) to 4 (absolutely correct). The rating is positively correlated with the satisfaction with life. Here, the ADHS has an acceptable degree of confidence of 0.878.

PSS

The PSS is a 13-item scale that measures the pressure felt by the respondents within the last month (e.g. “How frequent were you disturbed by something that happened unexpectedly?”). The items are rated between 1 (often) to 5 (never). Here, the PSS has a high degree of confidence of 0.945.

Data Analysis and Results

Descriptive statistical analysis of variables

The SPSS 24.0 was introduced to discuss the correlation between the test data. $P < 0.01$ means the correlation is significant at the level of 0.01, while $P < 0.05$ means the correlation is statistically significant at the level of 0.05.

Through correlation analysis, the author investigated which factors of the background information have impacted the mental health of the ATYIs. The mean, standard deviation and correlation of each variable in the PPQ, the SCL-90, the ADHS and the PSS are listed in Tables 1~4, respectively.

In the PPQ, the respondents' ratings have a significant negative correlation with gender ($r = -0.11$, $p < 0.01$), scholarship reception ($r = -0.09$, $p < 0.01$) and service as student cadre ($r = -0.19$, $p < 0.01$), and a significant positive correlation with family income ($r = 0.09$, $p < 0.05$), academic performance ($r = 0.24$, $p < 0.01$) and interpersonal relationship ($r = 0.40$, $p < 0.01$).

In the SCL-90, the respondents' ratings have a significant negative correlation with family income ($r = -0.13$, $p < 0.01$), academic performance ($r = -0.13$, $p < 0.01$) and interpersonal relationship ($r = -0.15$, $p < 0.01$), and a significant positive correlation with parenting style at the level of 0.05.

In the ADHS, the respondents' ratings have a significant negative correlation with gender ($r = -0.09$, $p < 0.01$), scholarship reception ($r = -0.09$, $p < 0.01$) and service as student cadre ($r = -0.16$, $p < 0.01$), and a significant positive correlation with family income ($r = 0.11$, $p < 0.01$), academic performance ($r = 0.16$, $p < 0.01$), and interpersonal relationship ($r = 0.28$, $p < 0.01$). In addition, the ratings have a significant positive correlation with being the single-child at the level of 0.05.

In the PSS, the respondents' ratings have a significant negative correlation with gender ($r = -0.08$, $p < 0.01$), scholarship reception ($r = -0.09$, $p < 0.01$) and service as student cadre ($r = -0.08$, $p < 0.05$), and a significant positive correlation with family income ($r = 0.07$, $p < 0.05$), academic performance ($r = 0.13$, $p < 0.01$) and interpersonal relationship ($r = 0.24$, $p < 0.01$).

Table 1. The mean, standard deviation and correlation of each variable in the PPQ

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1.68	0.47	1											
2. Professional	1.31	0.66	-0.16**	1										
3. Origin of student	1.91	0.97	0.07*	-0.06	1									
4. Family economic situation	1.78	0.47	0.11**	-0.05	0.39**	1								
5. Whether or not the only	1.54	0.50	0.03	0.05	-0.36**	-0.17**	1							
6. Parenting style	2.51	0.88	-0.08*	0.05	-0.17**	-0.13**	0.17**	1						
7. Whether the single parent family	1.91	0.28	-0.01	-0.06	-0.08*	0.09**	0.07*	-0.04	1					
8. Study result	3.37	0.83	0.09**	-0.00	0.00	0.10**	0.01	-0.02	0.01	1				
9. Whether the scholarship	1.67	0.47	-0.04	-0.05	0.06	-0.05	-0.03	-0.10**	-0.01	-0.35**	1			
10. Whether to take on any cadres	1.44	0.50	0.05	-0.04	-0.08*	-0.14**	0.02	0.04	0.01	-0.22**	0.29**	1		
11. Relationship status	2.30	0.51	-0.11**	0.04	0.12**	0.12**	-0.05	-0.03	0.03	0.18**	-0.10**	-0.27**	1	
12. PPQ	4.87	0.81	-0.11**	0.02	0.05	0.09*	-0.03	0.00	0.03	0.24**	-0.09**	-0.19**	0.40**	1

Table 2. The mean, standard deviation and correlation of each variable in the SCL-90

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1.68	0.47	1											
2. Professional	1.31	0.66	-0.16**	1										
3. Origin of student	1.91	0.97	0.07*	-0.06	1									
4. Family economic situation	1.78	0.47	0.11**	-0.05	0.39**	1								
5. Whether or not the only	1.54	0.50	0.03	0.05	-0.36**	-0.17**	1							
6. Parenting style	2.51	0.88	-0.08*	0.05	-0.17**	-0.13**	0.17**	1						
7. Whether the single parent family	1.91	0.28	-0.01	-0.06	-0.08*	0.09**	0.07*	-0.04	1					
8. Study result	3.37	0.83	0.09**	-0.00	0.00	0.10**	0.01	-0.02	0.01	1				
9. Whether the scholarship	1.67	0.47	-0.04	-0.05	0.06	-0.05	-0.03	-0.10**	-0.01	-0.35**	1			
10. Whether to take on any cadres	1.44	0.50	0.05	-0.04	-0.08*	-0.14**	0.02	0.04	0.01	-0.22**	0.29**	1		
11. Relationship status	2.30	0.51	-0.11**	0.04	0.12**	0.12**	-0.05	-0.03	0.03	0.18**	-0.10**	-0.27**	1	
12.SCL90	1.47	0.51	-0.02	0.04	-0.05	-0.13**	0.01	0.07*	-0.01	-0.13**	0.06	0.04	-0.15**	1

Table 3. The mean, standard deviation and correlation of each variable in the ADHS

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1.68	0.47	1											
2. Professional	1.31	0.66	0.16**	1										
3. Origin of student	1.91	0.97	0.07*	-0.06	1									
4. Family economic situation	1.78	0.47	0.11**	-0.05	0.39**	1								
5. Whether or not the only	1.54	0.50	0.03	0.05	-0.36**	-0.17**	1							
6. Parenting style	2.51	0.88	-0.08*	0.05	-0.17**	-0.13**	0.17**	1						
7. Whether the single parent family	1.91	0.28	-0.01	-0.06	-0.08*	0.09**	0.07*	-0.04	1					
8. Study result	3.37	0.83	0.09**	-0.00	0.00	0.10**	0.01	-0.02	0.01	1				
9. Whether the scholarship	1.67	0.47	-0.04	-0.05	0.06	-0.05	-0.03	-0.10**	-0.01	-0.35**	1			
10. Whether to take on any cadres	1.44	0.50	0.05	-0.04	-0.08*	-0.14**	0.02	0.04	0.01	-0.22**	0.29**	1		
11. Relationship status	2.30	0.51	-0.11**	0.04	0.12**	0.12**	-0.05	-0.03	0.03	0.18**	-0.10**	-0.27**	1	
12. ADHS	2.80	0.41	-0.09**	0.05	0.04	0.11**	-0.08*	-0.02	0.00	0.16**	0.09**	0.16**	0.28**	1



Table 4. The mean, standard deviation and correlation of each variable in the PSS

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1.68	0.47	1											
2. Professional	1.31	0.66	0.16**	1										
3. Origin of student	1.91	0.97	0.07*	0.06	1									
4. Family economic situation	1.78	0.47	0.11**	0.05	0.39**	1								
5. Whether or not the only	1.54	0.50	0.03	0.05	0.36**	0.17**	1							
6. Parenting style	2.51	0.88	-0.08*	0.05	0.17**	0.13**	0.17**	1						
7. Whether the single parent family	1.91	0.28	-0.01	0.06	-0.08*	0.09**	0.07*	-0.04	1					
8. Study result	3.37	0.83	0.09**	0.00	0.00	0.10**	0.01	-0.02	0.01	1				
9. Whether the scholarship	1.67	0.47	-0.04	0.05	0.06	-0.05	-0.03	0.10**	0.01	0.35**	1			
10. Whether to take on any cadres	1.44	0.50	0.05	0.04	-0.08*	0.14**	0.02	0.04	0.01	0.22**	0.29**	1		
11. Relationship status	2.30	0.51	0.11**	0.04	0.12**	0.12**	-0.05	-0.03	0.03	0.18**	0.10**	0.27**	1	
12. PSS	3.27	0.66	-0.08*	0.03	0.03	0.07*	-0.03	0.00	0.01	0.13**	0.09**	-0.08*	0.24**	1

Pooled data analysis

The factors with significant positive correlations were selected from the four scales, put into the same table (Table 5), and ranked in descending order of correlation. As shown in Table 5, the respondents’ ratings in the four scales are influenced by 8 factors. Among them, the family income, academic performance and interpersonal relationship are completely correlated with the ratings in the four scales; gender, scholarship reception and service as student cadre are strongly correlated with these ratings; by contrast, parenting style and being the single-child are weakly correlated with these ratings.

Table 5. Factors with significant positive correlations in the four scales

Variable	scale			
	PPQ	SCL90	ADHS	PSS
Relationship status	0.40**	-0.15**	0.28**	0.24**
Study result	0.24**	-0.13**	0.16**	0.13**
Family economic situation	0.09*	-0.13**	0.11**	0.07*
Gender	0.11**		-0.09**	-0.08*
Whether a scholarship has been awarded	0.09**		-0.09**	-0.09**
Whether to serve as a cadre	0.19**		-0.16**	-0.08*
Parenting style		0.07*		
Whether or not the only			-0.08*	

**Discussion
Conclusions**

The four scales in this research reflect the overall mental health of the ATYIs from four aspects: optimism, mental symptoms, satisfaction with life, and the pressure felt in the last month. The results show that the indices in all four aspects are affected by family income, academic performance and interpersonal relationship (Kelley, 2011). Thus, the first question raised in our research is

answered: family income, academic performance and interpersonal relationship are the main factors influencing the mental health of the ATYIs.

Apart from these three main factors, the pooled data analysis demonstrates that the mental health of the ATYIs is also heavily influenced by gender, scholarship reception and service as student cadre. As for the latter two factors, whether a student could receive the scholarship or serve as student cadre at college respectively depend on academic performance and interpersonal relationship. Therefore, these two factors can be roughly merged into academic performance and interpersonal relationship. Putting gender aside, the second question raised in our research can be answered considering the positive correlation between the mental health of the ATYIs and the three main factors in the preceding paragraph: the ATYIs tend to have a good mental health if they were born in a rich family, received scholarship in college, performed well academically, served as student cadres, and maintained a good relationship with others (Kim *et al.*, 2016). These ATYIs are more optimistic (PPQ), prone to mental symptoms (SCL-90), satisfied with life (ADHS) and pressure resilient (PSS).

Furthermore, the test data reveal that male respondents scored higher than their female counterparts in most mental health indices (except the SCL-90, in which the rating is negatively correlated with mental health). Thus, males are mentally healthier than females (Csukly *et al.*, 2008).



Practical significance

Based on the existing results, it is concluded that the mental health of the ATYIs is mainly influenced by such three factors as family income, academic performance and interpersonal relationship. The finding provides a reference for mental health education in colleges and points the direction for the ATYIs to improve their mental health (Gong and Zhao, 2013). In general, colleges and the society must provide the ATYIs with good learning and social environments, so that they could keep a healthy mental state. More importantly, the ATYIs must be lifted out of the plight of low income (Aka and Gencoz, 2014). Considering the gender difference in mental health, more attention should be paid to females. In addition to these external measures, the ATYIs should make proper adjustments internally (Greer *et al.*, 2004).

Research limitations

This research still has some limitations. The findings may not reflect the exact mental state of the ATYIs. In future, the author will devote more time, manpower and materials to creating a greater sample size, and improve the accuracy of the research.

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