

The Influence of Positive Affect on Mental Health of Undergraduates from Hong Kong, Macao and Taiwan in the Context of Smoke-free Campus in Chinese Mainland

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Abstract: In recent years, more and more young people from Hong Kong, Macao and Taiwan have come to universities in Chinese Mainland for higher education. However, due to the differences in political, economic and cultural environment between Hong Kong, Macao and Taiwan regions and Chinese Mainland, these young people have encountered psychological problems such as examination anxiety, interpersonal loneliness and lack of sense of meaning in life due to the related learning and life difficulties in Chinese mainland universities, which affect their growth and success. Many of the students originally thought that smoking was used in a more secluded environment to relieve stress, psychological counseling and energy recovery, but in fact smoking brings more harm. In the creation of a smoke-free campus, a variety of measures are adopted to give full play to the positive emotions of students to promote their mental health, which will help to achieve the creation of a smoke-free campus and share a healthy life on the campus. Based on the survey of a total of 658 undergraduates from Hong Kong, Macao and Taiwan in H University on their positive affect and mental health, the following conclusions are drawn through data analysis: undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland have positive affect at the upper-middle level, negative affect and overall affect at the lower-middle level; some undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities have middle-level mental health status and significant differences in grade and family relationship satisfaction; family relationship satisfaction has an important impact on students' emotional and mental health; the negative emotional performance and mental health of senior students, science students and students with low family relationship satisfaction need more attention from educators. Correlation analysis shows that positive affect is positively correlated with health concerns, energy status, satisfaction and interest in life, mood status, control of emotions and behaviors, relaxation and tension, and total score of mental health ($P < 0.01$). Regression analysis shows that positive affect has significant positive predictive effects on six factors in mental health, such as "health concerns", "satisfaction and interest in life", "energy", "mental state", "control of emotions and behaviors", "relaxation and tension" and mental health.

The enlightenment of this study lies in the suggestions that actions should be taken from the two levels of school education and home-school combination to strengthen the cultivation of positive affect of Hong Kong, Macao and Taiwan undergraduates in Chinese mainland universities, so as to improve their mental health level.

Key words: Chinese mainland universities; smoking-free campus; positive affect; mental health

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In recent years, more and more young people from Hong Kong, Macao and Taiwan have come to universities in Chinese Mainland for higher education. According to the data released by the Ministry of Education of the People's Republic of China, about 45,000 students from Hong Kong, Macao and Taiwan were educated in universities in Chinese Mainland during the 13th Five-Year Plan period. However, due to the differences in political, economic and cultural environment between Hong Kong, Macao and Taiwan regions and Chinese Mainland, these young people have encountered psychological problems such as examination anxiety, interpersonal loneliness and lack of sense of meaning in life due to the related learning and life difficulties in Chinese mainland universities, which affect their growth and success. Studies have shown that smoking is closely related to physical and mental health.¹⁻³ Many students originally thought that smoking can be used in a more secluded environment to relieve stress, psychological counseling and energy recovery, but smoking actually brings more harm. In the creation of a smoke-free campus, a variety of measures are adopted to give full play to the positive emotions of students to promote their mental health, which will help to achieve the creation of a smoke-free campus and share a healthy life on the campus. The development of positive psychology has made the related research on positive mood increasingly a focus of academic attention. In this study, positive affect is defined by the viewpoint of Professor Meng Zhaolan,⁴ a Chinese scholar, that is, positive affect is a happy and relaxed affect that college students can experience subjectively when their self-needs are met, and this subjective experience can also promote the individual's action ability and enthusiasm. Thus, positive affect has the following

characteristics: first, it is associated with the satisfaction of individual needs with the subjective experience of pleasure; Second, positive affect includes not only transient emotional states, such as happiness, joy, gratitude, interest, and satisfaction, but also low tension, low attention and concentration, and diffuse and continuous emotional states. Studies have shown that positive affect can promote physical health, offset the psychological effects of negative affect, improve and enhance happiness,⁵⁻⁸ enhance self-resilience, promote the recovery of individuals from life stress events,⁹⁻¹¹ and help improve mental health.¹²⁻¹³

A review of research on the relationship between positive affect and mental health in China, it is found that major researchers believe that positive affect promote the development of individual physical and mental health through corresponding mechanisms and models,¹⁴⁻¹⁵ and some researchers also believe that pursuing positive affect may lead to negative consequences and explore the mechanism.¹⁶ Smoking seriously harms the health of students, and smoking can cause many diseases. According to statistics, 33% of all cancers are caused by smoking. Smoking is the main cause of lung cancer, and 90% of lung cancers stem from the use of various forms of tobacco products. Smoking can also cause cancer in other parts of the body, such as the mouth, throat, esophagus, stomach, pancreas, and cervix. After graduating from university, these young people will shoulder the historical mission of building the motherland and rejuvenating China. Their physical and mental health is directly related to the destiny of the country and the progress of society. Therefore, under the Background of Smoking-free Campus, studying the influence of positive affect on mental health of undergraduates from Hong Kong, Macao

and Taiwan in Chinese mainland universities will help to improve the psychological education service policies of mainland universities for these young people, enhance their positive emotional experience, cultivate their positive personality and improve their mental health level.

RESEARCH OBJECTS AND METHODS

H university, as a key university built by the Chinese government, is one of the earliest universities in Chinese Mainland that recruit students from Hong Kong, Macao and Taiwan, and it is also one of the universities with the largest number of students from Hong Kong, Macao and Taiwan in Chinese Mainland. According to the school's data for January 2021 in official website, the school has 6,140 students from Hong Kong, Macao and Taiwan and more than 80 countries. In this study, the students in H University were selected as case samples. From January to February, 2021, the survey team conducted a random sampling survey in H University in Chinese Mainland, and collected 658 valid questionnaires, including 436 students from Hong Kong, 116 students from Macau and 106 students from Taiwan Province. Spss22.0 was used for data analysis.

In particular, the topic of this study is to explore the impact of positive affect on mental health of undergraduates from Hong Kong, Macao and Taiwan studying in Chinese Mainland. According to a mainstream view in academic circles, general well-being refers to the connotation of an individual's overall evaluation of his or her quality of life according to a self-defined standard, which mainly measures long-term rather than short-term emotional responses, interpersonal relationships and life satisfaction, and is a relatively stable value.¹⁷ Mental health, as a balanced relationship between human inner world and objective environment, is the maintenance of a good interpersonal relationship between self and others.¹⁴ At the Third International Mental Health Conference, it was clearly pointed out that "well-being" is the core symbol of mental health. According to the mainstream well-being measurement scale in China, the measurement factors of well-being, the internal meaning of mental health (physical health, interpersonal

relationship, emotional situation, life satisfaction, etc.) and the operational feasibility are comprehensively considered, and combined with the suggestions of relevant psychological experts, the mental health measurement of undergraduates in Hong Kong, Macao and Taiwan regions in China is carried out with the general well-being scale (GWB scale, Duan Jianhua, 1996) to compare with the national average, and the other is that the higher the average score, the stronger the overall happiness, the better the physical and mental health, and the higher the interpersonal and life satisfaction. There are two criteria for the final measurement results of the mental health scale, one is to compare with the national average, and the other is that the higher the average score, the stronger the overall happiness, the better the physical and mental health, and the higher the interpersonal and life satisfaction.

The research questionnaire Research on the Impact of Positive Affect on Mental Health of Undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities mainly has three parts, which are demographic variables, Chinese version of Positive and Negative Affect Scale (C-PANAS), and mental health status scale. The questionnaire has an overall Cronbach's Alpha coefficient value of 0.793, with a total of 43 items. The emotional questionnaire has a Cronbach's Alpha coefficient value of 0.882, with a total of 18 items, and 9 for each of the positive and negative situations. The mental health questionnaire has a Cronbach's Alpha coefficient value of 0.804, with a total of 18 items, including six factors: health concerns, energy, satisfaction and interest in life, mood, control over emotion and behavior, relaxation and tension. In order to improve the effectiveness of the survey data, nine questions in the questionnaire are designed by reverse question-and-answer method, and the data are processed in a positive way before data analysis. Affect scale and mental health survey are based on the general situation of the respondents in the latest month. The above shows that the validity of the questionnaire and data meets the relevant statistical standards.

RESULTS AND DISCUSSION**The Characteristics of Positive Affect of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities****General situation of positive affect of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities**

Table 1 Descriptive Analysis of Positive Affect of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)				
Name	Mean	SD	Max	Min
Positive affect	29.37	7.40	45	9
Negative affect	21.29	7.99	45	9
Total score of affect	50.66	10.8	90	18

According to Table 1, the average score of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities is 29.37 in positive affect (higher than the theoretical mean of 27), 21.29 in negative affect (lower than the theoretical mean of 27), and 50.66 in total affect score (lower than the theoretical mean of 54). The affect scale adopts five-level evaluation method,

and the higher the score, the stronger the corresponding emotional dimension.

Differences in demographic variables of positive affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Differences in gender of positive affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 2 Analysis on the Differences in Gender of Positive Affect Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)						
Name	Male (N=256)		Female (N=402)			
	Average	SD	Average	SD	T	P
Positive affect	29.60	6.97	29.22	7.67	.64	.519
Negative affect	22.95	7.93	20.23	7.86	4.28	.000**
Total score of affect	52.55	9.75	49.45	11.27	3.73	.000**

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 2, undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities have significant gender differences in the total affect scores and the mean negative affect scores, but not in positive affect. Moreover, the

mean affect scores of male students are much higher than those of female students.

Differences in origin of positive affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 3 Analysis on the Differences in Origin of Positive Affect Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)	
Cities and towns (N=602)	Countryside (N=56)

Name	Average	SD	Average	SD	T	P
Positive affect	29.25	7.24	30.68	8.91	-1.38	.166
Negative affect	21.29	7.96	21.25	8.40	-1.16	.970
Total score of affect	50.54	10.66	51.93	12.26	-.92	.358

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 3, there is no significant difference in the total scores of affect and the average scores of positive affect and negative affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities.

Differences in academic direction of positive affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 4 Analysis on the Differences in Academic Direction of Positive Affect Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)				
		Positive affect	Negative affect	Total affect score
Liberal arts	Mean	29.55	21.33	50.89
N=472	SD	7.43	8.22	11.10
Science	Mean	28.77	24.63	53.40
N=60	SD	7.95	8.53	11.02
Engineering	Mean	28.43	20.43	48.87
N=46	SD	6.02	6.35	8.41
Arts and sports	Mean	29.28	19.00	50.66
N=80	SD	7.62	6.05	9.55
F value		.47	5.99	3.10
P value		.700	.000**	.026*

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 4, there is no significant difference in the average scores of positive affect among the students of liberal arts, science, engineering and arts and sports, but significant differences in the total scores of negative affect and emotions. In the dimension of negative affect, the average scores of the four subject categories are ranked as science > liberal arts > engineering > art, indicating that science students have the most intense negative affect in the dimension of negative affect. In the dimension of total affect scores, the average scores of science students are the highest in the four subject categories, which brings an

enlightenment that according to the survey sample data, the emotion management of science students among Hong Kong, Macao and Taiwan undergraduates in Chinese mainland universities deserves the attention of school educators. Post Hoc post-test multiple comparisons reveal that the significant difference in variance test in negative affect dimension is mainly caused by the difference between science students and liberal arts students, engineering students and arts and sports students. The significant difference of variance test in the dimension of total affect score is mainly caused by the difference between science students, engineering students and art and sports students.

Differences in grade of positive affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 5 Analysis on the Differences in Grade of Positive Affect Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)				
		Positive affect	Negative affect	Total affect score
Freshmen	Mean	29.87	20.41	50.28
N=232	SD	8.10	8.33	11.10
Sophomores	Mean	28.88	21.89	50.76
N=192	SD	5.72	6.77	11.02
Juniors	Mean	30.65	20.67	51.33
N=110	SD	8.18	9.29	8.41
Seniors	Mean	28.05	22.56	50.61
N=124	SD	7.42	7.71	9.55
F value		3.08	5.99	3.10
P value		.027*	.052	.866

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 5, there are significant differences in average scores of positive affect among senior students, but no significant differences in total scores of negative affect and emotions. In the dimension of positive affect, freshmen have the highest average score, while seniors have the lowest. In the dimension of negative affect, senior students have the highest average score, while freshmen have the lowest. On the total affect score, the corresponding average score is higher as the grade increases from freshman to junior, and the average score of the total affect score of senior students is the lowest. In the graduation year, because of many practical problems and pressures, such as graduation internship, employment for the first time in life, friendship and even love, the positive affect scores the lowest among the four grades, while the

negative affect scores the highest among the four grades. The author found out in actual work that senior students often use smoking to relieve the huge pressure they face. However, because of the creation of a smoke-free campus, the school adopts tobacco control propaganda, and formulated student management regulations that clearly prohibit students from smoking. Students often use the bathroom Smoking in hidden corners of campus. Therefore, educators need to take corresponding measures to provide targeted employment services and social psychological support for the senior students from Hong Kong, Macao and Taiwan studying in Chinese mainland universities.

Differences in region of positive affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 6
Analysis on the Differences in Region of Positive Affect Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)

		Positive affect	Negative affect	Total affect score
Hong Kong China	Mean	28.99	21.17	50.16
N=232	SD	7.13	7.80	10.39
Macao China	Mean	28.98	23.26	52.24
N=192	SD	7.99	8.14	11.39
Taiwan China	Mean	31.36	19.62	50.98
N=110	SD	7.60	8.24	11.73
F value		4.61	5.95	1.76
P value		.010*	.003**	.172

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 6, there are significant differences in positive affect and negative affect among undergraduates from Hong Kong, Macao and Taiwan, China, but no significant difference in total affect scores. In the dimension of positive affect, the average scores of undergraduates from Hong Kong, Macao and Taiwan in China are all higher than the median critical value of 27 points (the median critical value is 27 for 9 topics in the dimension of positive affect by the five-level evaluation method), which indicates that the undergraduates from Hong Kong, Macao and Taiwan who study in universities in Chinese Mainland perform better in positive affect, and the

students with the highest average scores are from Taiwan China, and in the dimensions of negative affect and the total score, the undergraduates with the highest average scores are from Macao. In summary, among the students from Hong Kong, Macao and Taiwan regions in Chinese mainland universities, the emotion management and adjustment of undergraduates in Macao region need more attention from educators.

Differences in family relationship satisfaction of positive affect among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 7
Analysis on the Differences in Family Relationship Satisfaction of Positive Affect Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)

		Positive affect	Negative affect	Total affect score
Satisfied	Mean	30.04	20.62	50.66
N=460	SD	7.25	8.05	10.69
General	Mean	27.71	22.30	50.01
N=180	SD	7.30	7.39	10.14
Dissatisfied	Mean	28.67	28.33	57.00
N=18	SD	9.68	8.49	17.30
F value		6.60	10.32	3.44
P value		.001**	.000**	.032*

According to Table 7, there are significant differences in the family relationship satisfaction in the dimensions of positive affect, negative affect and total scores of affect among undergraduates from Hong Kong, Macao and Taiwan attending universities in Chinese Mainland. In the three dimensions of emotional measurement, the higher the students' satisfaction with family relationship, the better the stability of their emotional performance. The lower the students' satisfaction with family relationship, the stronger their negative affect. In the 658 valid samples of this survey, 18 people, accounting for 2.73%, were dissatisfied with their family relationship, so the emotional performance of this group should be paid attention

to. Consequently, schools can find students of this group by means of personal conversation, psychological screening and file inquiry after freshmen enter school, and bring them into the management of psychological safety account as soon as possible, so as to provide them with more effective social support.

Characteristics of Mental Health of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities

Mental health status of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 8 Descriptive Analysis on the Mental Health Status of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)				
Name	Mean	SD	Max	Min
Health concerns	7.59	2.28	15	1
Satisfaction and interest in life	9.82	1.94	14	5
Energy	15.19	3.39	23	4
Mental state	16.55	3.59	23	4
Control of emotions and behaviors	15.09	2.50	21	7
Relaxation and tension	16.02	4.11	25	3
Mental health status	80.27	11.70	117	42

According to Table 8, undergraduates from Hong Kong, Macao and Taiwan in universities in Chinese Mainland have an average score of 80.27 in mental health, 7.59 in health concerns, 9.82 in satisfaction and interest in life, 15.19 in energy, 16.55 in mental state, 15.09 in control of emotion and behavior, and 16.02 in relaxation and tension, all of which are higher than the national average score.

Differences in Demographic Variables of Mental Health among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities

Differences in gender of mental health among undergraduates from Hong Kong, Macao and Taiwan in chinese mainland universities

According to Table 9, the gender differences in the mental health of undergraduates from Hong Kong, Macao and Taiwan in mainland and universities are not significant in other factors except for the significant differences in health concerns and control of emotions and behaviors. As far as the scale used in this study is concerned, the average score is 75 for male (national norm score) and 71 for female (national norm score). The mental health scores of students from Hong Kong, Macao and Taiwan in Chinese mainland

universities are 80.23 for males and 80.29 for females.

Differences in origin of mental health among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland

Table 9 Analysis on Differences in Gender of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)						
Name	Male (N=256)		Female (N=402)		T	P
	Mean	SD	Mean	SD		
Health concerns	7.25	2.48	7.81	2.12	-2.98	.003**
Satisfaction and interest in life	9.92	2.08	9.75	1.85	1.09	.274
Energy	15.45	3.44	15.03	3.35	1.51	.131
Mental state	16.64	3.53	16.49	3.63	.51	.607
Control of emotions and behaviors	15.41	2.63	14.89	2.40	2.55	.011*
Relaxation and tension	15.56	4.34	16.32	3.93	-2.25	.025
Mental health status	80.23	11.89	80.29	11.59	-.07	.943

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

Table 10 Analysis on Differences in Origin of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)						
Names	Cities and towns (N=602)		Countryside (N=56)		T	P
	Mean	SD	Mean	SD		
Health concerns	7.59	2.27	7.57	2.40	0.07	.942
Satisfaction and interest in life	9.81	1.91	9.93	2.33	-.44	.656
Energy	15.15	3.37	15.71	3.56	-1.19	.231
Mental state	16.59	3.56	16.11	3.86	.96	.335
Control of emotions and behaviors	15.09	2.50	15.11	2.57	-.05	.953
Relaxation and tension	16.05	4.03	15.75	4.94	0.52	.602
Mental health status	80.28	11.56	80.18	13.23	.05	.953

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 10, there is no significant difference in the origin on the mental health status and the mean scores of each factor of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities.

Differences in academic direction of mental health among Undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 11 Analysis on Differences in Academic Direction of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)					
		Health concerns	Satisfaction and interest in life	Energy	Mental state
Liberal arts	Mean	7.67	9.78	15.22	16.59
N=472	SD	2.28	1.95	3.31	3.51
Science	Mean	7.63	9.63	14.90	15.73
N=60	SD	2.94	2.37	4.27	4.55
Engineering	Mean	6.65	10.30	15.00	16.39
N=46	SD	1.82	1.34	2.59	3.12
Art and sports	Mean	7.68	9.93	15.35	17.03
N=80	SD	1.82	1.83	3.56	3.47
F value		2.82	0.26	1.55	1.34
P value		.038*	.848	.200	.259

Table 11 Analysis on Differences in Academic Direction of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658) (Contd.)				
		Control of emotions and behaviors	Relaxation and tension	Mental health
Liberal arts	Mean	15.18	16.20	80.63
N=472	SD	2.65	4.05	11.59
Science	Mean	14.63	14.63	77.17
N=60	SD	2.02	4.92	14.75
Engineering	Mean	14.65	16.00	79.00
N=46	SD	1.96	3.02	9.47
Art and sports	Mean	15.15	16.05	81.18
N=80	SD	2.14	4.20	10.65
F value		1.34	1.98	1.90
P value		.259	.047*	.128

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 11, there are significant differences in the mental health of the students in the four major categories of arts, science, engineering and arts and sports in terms of health concerns, relaxation and tension, but no significant

differences in other factors. The average score of engineering students is the lowest in terms of specific factors, such as health concerns and satisfaction and interest in life. The average score of science students is the lowest in the total scores of specific factors such as energy, mental state,

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control of emotions and behaviors, relaxation and tension and mental health, which indicates that the mental health performance of science students is the worst among the four disciplines. To sum up, from the perspective of subject categories, the mental health of science students needs more attention and work input from the school.

Differences in grade of mental health among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 12 Analysis on Differences in Grade of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)					
		Health concerns	Satisfaction and interest in life	Energy	Mental state
Freshmen	Mean	7.80	10.09	15.56	16.82
N=232	SD	2.33	2.01	3.68	3.61
Sophomores	Mean	7.48	9.60	14.76	16.19
N=192	SD	2.09	1.79	2.79	3.17
Juniors	Mean	7.53	9.98	15.80	17.31
N=110	SD	2.41	1.88	3.61	4.14
Seniors	Mean	7.44	9.48	14.65	15.94
N=124	SD	2.35	2.03	3.33	3.52
F value		1.03	3.85	4.25	3.98
P value		.378	.009**	.005**	.008**

Table 12 Analysis on Differences in Grade of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (Contd.)				
		Control of emotions and behaviors	Relaxation and tension	Mental health
Freshmen	Mean	15.58	16.58	82.43
N=232	SD	2.60	4.23	12.20
Sophomores	Mean	14.69	15.77	78.49
N=192	SD	2.41	3.68	10.19
Juniors	Mean	14.73	16.53	81.87
N=110	SD	2.23	4.83	13.49
Seniors	Mean	15.11	14.94	77.55
N=124	SD	2.54	3.58	10.26
F value		5.46	5.18	7.24
P value		.001**	.002**	.000**

Note: * indicates P < 0.05, ** indicates P < 0.01.

According to Table 12, there are significant differences in mental health status and sub-factors among students from Hong Kong, Macao and Taiwan in Chinese mainland universities of different grades except for their health concerns. Sophomore students scored the lowest in the control factors of affect and behavior, seniors scored the lowest in the satisfaction and interest in life, energy, mental state, relaxation and tension, as well as the mental health status. According to Table

5, the emotions of senior students are also the strongest among the four grade groups (i.e., the negative affect of senior students). To sum up, the senior students should be the key group in the management of student affairs and moral education in schools.

Differences in region of mental health among undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 13 Analysis on Differences in Region of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)					
		Health concerns	Satisfaction and interest in life	Energy	Mental state
Hong Kong China	Mean	7.59	9.81	15.28	16.40
N=436	SD	2.20	1.93	3.29	3.63
Macao China	Mean	7.91	9.67	14.76	16.52
N=116	SD	2.61	2.07	3.54	3.56
Taiwan China	Mean	7.26	10.02	15.32	17.21
N=106	SD	2.21	1.87	3.64	3.42
F value		2.25	0.89	1.16	1.17
P value		.106	.410	.312	.115

Table 13 Analysis on Differences in Region of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (Contd.)				
		Control of emotions and behaviors	Relaxation and tension	Mental health
Hong Kong China	Mean	15.28	16.14	80.49
N=436	SD	2.56	4.22	11.98
Macao China	Mean	14.74	15.74	79.34
N=116	SD	2.19	4.09	11.11
Taiwan China	Mean	14.68	15.87	80.36
N=106	SD	2.48	3.67	11.20
F value		3.83	.51	.44
P value		.022*	.598	.643

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

According to Table 13, the mental health status of

undergraduates from Hong Kong, Macao and Taiwan Province has significant differences in the

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control of emotions and behaviors, but not significant in other factors. On the average score of mental health, the average score of undergraduates in Macao is the lowest.

Differences in family relationship satisfaction of mental health among Undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

Table 14 Analysis on Differences in Family Relationship Satisfaction of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658)					
		Health concerns	Satisfaction and interest in life	Energy	Mental state
Satisfied	Mean	7.48	10.13	15.77	17.23
N=460	SD	2.27	1.95	3.30	3.47
General	Mean	7.79	9.18	13.78	15.10
N=180	SD	2.28	1.68	3.29	3.23
Dissatisfied	Mean	8.56	8.11	14.67	13.56
N=18	SD	2.22	1.84	2.37	4.28
F value		2.85	24.31	24.06	31.98
P value		.058	.000**	.000**	.000**

Table 14 Analysis on Differences in Family Relationship Satisfaction of Mental Health Among Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities (N=658) (Contd.)				
		Control of emotions and behaviors	Relaxation and tension	Mental health
Satisfied	Mean	15.42	16.41	82.45
N=460	SD	2.55	4.23	11.62
General	Mean	14.39	15.41	75.64
N=180	SD	2.11	3.60	10.54
Dissatisfied	Mean	13.67	12.22	70.78
N=18	SD	3.02	2.98	5.05
F value		14.46	12.13	30.44
P value		.000**	.000**	.000**

Note: * indicates P < 0.05, ** indicates P < 0.01.

According to Table 14, in terms of family relationship satisfaction, there is no significant difference in the factor of health concerns among undergraduates from Hong Kong, Macao and Taiwan in universities in Chinese Mainland, but very significant differences in other factors. In terms of satisfaction and interest in life, mental state,

control of emotions and behaviors, relaxation and tension, and mental health, the higher students' satisfaction with family relationship, the higher their average score. According to Table 7 and Table 14, family relationship was found to be an important factor affecting the relationship between students' emotional performance and mental health.

The Relationship between Positive Affect and Mental Health of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities

Correlation analysis on positive affect and mental health of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

In order to understand the correlation between positive affect and mental health of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities, Pearson correlation method was used to test the correlation between the scores of positive affect and the total scores of mental health and the scores of each factor. The results are shown in Table 15.

Table 15 Correlation Analysis Between Positive Affect and Mental Health of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities							
	Health concerns	Energy	Satisfaction and interest in life	Mental state	Control of emotions and behaviors	Relaxation and tension	Total score of mental health
Positive affect	0.279**	0.528**	0.605**	0.638**	0.264**	0.321**	0.574**

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$.

Table 15 shows that the positive affect of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities are positively correlated with the total scores of health concerns, energy, satisfaction and interest in life, mental state, control of emotions and behaviors, relaxation and tension, and mental health, with correlation coefficients of 0.279, 0.528, 0.605, 0.638, 0.264, 0.321 and 0.574 respectively at the level of $P < 0.01$.

Regression analysis of positive affect on mental health of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities

According to the previous research results, there is a significant correlation between positive affect and mental health of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities, thus regression analysis was made on the factors of positive affect and mental health of undergraduates.

With positive affect as a predictive variable and health concerns as a dependent variable, multiple regression analysis was carried out and put into the regression equation. The results are shown in Table 16. Positive affect can predict health concerns, which is statistically significant at a significant level ($P < 0.001$) and can explain 7.8% of the variance.

Table 16 Regression Analysis of Positive Affect and Health Concerns of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities				
Independent variable	R square	Adjusted R square	F	β
Positive affect	.078	.077	55.561***	.086***

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

With positive affect as a predictive variable and satisfaction and interest in life as a dependent variable, multiple regression analysis was carried out and put into the regression equation. The results

are shown in Table 17. Positive affect can predict satisfaction and interest in life, which is statistically significant at a significant level ($P < 0.001$) and can explain 27.9% of the variance.

Table 17 Regression analysis of positive affect and satisfaction and interest in life of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities				
Independent variable	R square	Adjusted R square	F	β
Positive affect	.279	.278	254.117***	.139***

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

With positive affect as a predictive variable and energy as a dependent variable, multiple regression analysis was carried out and put into the regression

equation. The results are shown in Table 18. Positive affect can predict energy, which is statistically significant at a significant level ($P < 0.001$) and can explain 36.5% of the variance.

Table 18 Regression Analysis of Positive Affect and Energy of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities				
Independent variable	R square	Adjusted R square	F	β
Positive affect	.365	.364	377.771***	.277***

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

With positive affect as a predictive variable and mental state as a dependent variable, multiple regression analysis was carried out and put into the

regression equation. The results are shown in Table 19. Positive affect can predict mental state, which is statistically significant at a significant level ($P < 0.001$) and can explain 40.7% of the variance.

Table 19 Regression Analysis of Positive Affect and Mental State of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities				
Independent variable	R square	Adjusted R square	F	β
Positive affect	.407	.406	449.705***	.310***

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

With positive affect as a predictive variable and control of emotions and behaviors as a dependent variable, multiple regression analysis was carried out and put into the regression equation. The results

are shown in Table 20. Positive affect can predict control of emotions and behaviors, which is statistically significant at a significant level ($P < 0.001$) and can explain 7% of the variance.

Table 20 Regression Analysis of Positive Affect and Control of Emotions and Behaviors of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities				
Independent variable	R square	Adjusted R square	F	β
Positive affect	.070	.069	49.315***	.089***

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

With positive affect as a predictive variable and relaxation and tension as a dependent variable,

multiple regression analysis was carried out and put into the regression equation. The results are shown in Table 21. Positive affect can predict relaxation

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and tension, which is statistically significant at a significant level ($P < 0.001$) and can explain 10.3% of the variance.

Table 21 Regression Analysis of Positive Affect and Relaxation and Tension of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities				
Independent variable	R square	Adjusted R square	F	β
Positive affect	.103	.102	75.582***	.179***

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

With positive affect as a predictive variable and mental health as a dependent variable, multiple regression analysis was carried out and put into the

regression equation. The results are shown in Table 22. Positive affect can predict mental health, which is statistically significant at a significant level ($P < 0.001$) and can explain 33% of the variance.

Table 22 Regression Analysis of Positive Affect and Mental Health of Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities				
Independent variable	R square	Adjusted R square	F	β
Positive affect	.330	.329	322.795***	.907***

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

CONCLUSIONS and ENLIGHTENMENT

Research Conclusions

To sum up the analysis and discussion, the following conclusions are drawn in this paper:

(1) The positive affect state of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities: The positive affect of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities are on the middle level, while their negative affect and overall emotions are on the middle level because their positive affect is not significantly different in gender, origin and major category, but significantly different in grade, region and family relationship satisfaction, their total affect score is significantly different in gender, major category and family relationship satisfaction, but not significantly different in origin, grade and region; the negative emotional expression of senior students, science students and students with low family relationship satisfaction need to be noticed by educators and scientific and reasonable intervention measures

should be taken.

(2) The mental health status of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities: The mental health status of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities is at a moderate level, and there are no significant differences in gender, origin, major category and region, but significant differences in grade and family relationship satisfaction. In the total score of mental health, the average score of senior students is the lowest in terms of grade, and the average score of Macao students is the lowest in terms of region. Family relationship satisfaction has an important influence on students' emotional and mental health.

(3) The relationship between positive affect and mental health of undergraduates from Hong Kong, Macao and Taiwan in Chinese mainland universities: Correlation analysis shows that positive affect is positively correlated with health concerns, energy status, satisfaction and interest in life, mental state, control of emotions and behaviors, relaxation and tension, and total score of mental

health ($P < 0.01$). Regression analysis shows that positive affect has significant positive predictive effects on six factors in mental health, such as "health concerns", "satisfaction and interest in life", "energy", "mental state", "control of emotions and behaviors", "relaxation and tension" and mental health.

Research Enlightenment: Strengthening the Cultivation of Positive Affect for Undergraduates from Hong Kong, Macao and Taiwan in Chinese Mainland Universities

Studies have shown that there is a causal relationship between behavioral beliefs, behavioral attitudes and subjective norms¹⁸. The rational action theory believes that: human behavior is under the domination of its subjective consciousness. Information processing, analysis and thinking must be carried out before various behaviors occur. A series of reasons determine people's motives for implementing behaviors. People think that "rationality" is the main reason for the occurrence and maintenance of behavior. Reasonable action theory has been widely used in the understanding and intervention of healthy behaviors. After interviews, it is learned that in the creation of a smoke-free campus, the reason why students still smoke is that some students are lonely and relieve their worries through smoking; some students use smoking as a means of interpersonal communication, looking for informal organizations, to meet the needs of the inner sense of belonging. Therefore, a variety of measures must be taken to improve this behavior of students, especially to enhance their inner positive affect, improving their mental health, reducing hidden smoking behaviors, and promoting students' physical and mental health.

Previous studies have shown that the improvement of students' positive affect can affect their physical health, improve their energy, increase their satisfaction and interest in life, enable them to get a happier state of mind, enhance their self-control over emotions and behaviors, and have a more relaxed inner individual state, thus significantly improving their life satisfaction and ultimately their mental health. The conclusion of this study also shows that positive affect has a

significant positive predictive effect on mental health.

The psychological education network of "curriculum-activity-service" should be constructed to cultivate students' rational, peaceful and positive healthy mentality. In the aspect of curriculum teaching, directional characteristic courses should be offered for students from Hong Kong, Macao and Taiwan to improve their cross-cultural integration ability. In the aspect of brand psychological activities, mental health education and extracurricular practice should be organically integrated to promote diversified psychological education. At present, a systematic national education system for Hong Kong, Macao and Taiwan students has been formed in H University, especially the practical education system, which plays an important role in cultivating their' positive psychological emotions. Starting from the four angles of "rooted in China", "learning in China", "love in China" and "dream in China", the activities are carried out around the four aspects of "knowledge of national history, feelings of family and country, will to become a powerful nation and action to serve the country". Under the guidance of this collective learning, students can participate in the study of national history, carry out national condition research, receive national condition education and prepare national condition gift. Through the experiential learning and practice of "action-observation-reflection", they can obtain the experience and cognition of the ultimate value of individual learning, and their positive emotions such as feelings of family and country can also be effectively improved. In terms of providing professional counseling services, schools can help students improve their emotional state, correct cognitive bias and enhance their mental health literacy through psychological counseling and counseling.

The construction of school culture should be strengthened to create an atmosphere of humanistic care. Marx's has said: "The human creates the environment, the same environment also creates the human." H University has not only campus buildings with rich historical background, but also campus with green ecological scenery. The material environment on campus embodies the exchange of

human and spiritual strength, which is the objectification of human working mind and the material embodiment of human body and mind. For example, students can be guided to learn and feel the school spirit of patriotism, courage to take responsibility, openness and tolerance, and pursuit of excellence by fully appreciating the inscriptions donated by overseas Chinese and the rich history and culture behind them, and through special lectures and campus intelligent tour guide interpretation system, and by exerting the rich and profound emotions and intelligence embodied in the beautiful and quiet campus environment, students can be cultivated with deep and stable positive emotions. By building the school as a spiritual home for students, students are attracted to participate in campus cultural practice activities and are educated in truth, goodness and beauty in a true and natural state, thus permeating the knowledge, affection and behavior of students from Hong Kong, Macao and Taiwan. At the spiritual and cultural level, it is necessary to strengthen the construction of community, and take the community platform as the carrier to encourage students from Hong Kong, Macao and Taiwan to show their self-style by participating in activities, promote mutual understanding and trust, and cultivate their positive psychological feelings such as optimism and liveliness.

The family and school should unite to play the role of parents and build a warm and harmonious family relationship. It is the safest harbor in children's hearts, which requires parents to make efforts to create a warm family atmosphere and try their best to prevent children from being unable to find a confidant and emotional sustenance in their daily lives due to the tense family relationship and lack of family warmth in reality, thus avoiding interpersonal communication in reality and venting their sadness and anger through smoking. Parents should learn to inspire and guide their children's healthy growth with a rational and cheerful attitude. For example, they can establish communication with their children through some topics, and let their children understand the care and love from feelings and actions, so that they can get psychological support from family members and

establish confidence, so that they have more confidence to face the disappointments in life.

Author Declaration

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References

1. Clendennen Stephanie L, Vandewater Elizabeth A, Loukas Alexandra, et al. College Students' Exposure and Engagement with Tobacco-related Social Media. *Tobacco Regulatory Science*. 2020;(1):38-53.
2. Long YH, Wang Q, Yu ZW, et al. Effects of Smoking Behavior and Cognition of Tobacco Control on Digital Entertainment and Mental Health of School-Age Children during Holidays. *Tobacco Regulatory Science*. 2021;7(5):956-966.
3. Felicione NJ, Karaoghlanian N, Shihadeh A, et al. Comparison of Measurement Methods for Electronic Cigarette Puff Topography. *Tobacco Regulatory Science*. 2019;(3):242-252.
4. Meng ZL. Human Emotions. Shanghai People's Publishing House. 1989:23-42.
5. Ahmadi Forooshani S, Ertezaee B, Yazdkhasti F. The effectiveness of problem-solving therapy augmented spirituality on positive emotions and mental health: A pilot study. *Journal of Spirituality in Mental Health*. 2020;22(2):134-146.
6. Weiss Nicole H, Forkus Shannon R, Contractor Ateka A, et al. The Interplay of Negative and Positive Emotion Dysregulation on Mental Health Outcomes Among Trauma-Exposed Community Individuals. *Psychological Trauma: Theory, Research, Practice & Policy*. 2020;12(3):219-226.
7. Wouk K, Gottfredson, NC, Tucker C, et al. Positive Emotions During Infant Feeding and Postpartum Mental Health. *Journal of Spirituality in Mental Health*. 2019;28(2):194-202.
8. Bai CZ, Bai BY, Li Y, et al. Effect of Advantage Use on Nurses' Subjective Well-being: Mediating Role of Basic Psychological Needs Satisfaction. *Journal of Nursing Science*. 2020;(12):71-74.
9. Hu SN, Cheng ZJ, Dou DH, et al. Replacement recovery and mechanism of positive emotion from others to self-control resources. *Studies of Psychology and Behavior*. 2018;(01):45-50.

10. Gong Z, Yu LC, Schooler JW. The Relationship between Resilience and Mental Health: the Mediating Effect of Positive Emotions. *Applied Science and Innovative Research*. 2018;2(3):87-101.
11. Bai, Sunhye, Repetti, Rena L. Negative and Positive Emotion Responses to Daily School Problems: Links to Internalizing and Externalizing Symptoms. *Journal of Abnormal Child Psychology*. 2018;46(3):423-435.
12. Li XT, Lian R. The Relationship between Mental Health Positive Emotion and Job Burnout among Ideological and Political Educators. *Indian Journal of Pharmaceutical Sciences*. 2020;82(1):58-59.
13. Jiang B, He WX. Influencing mechanism and supporting path of cultural adaptation of migrant workers' children: positive psychological perspective. *Research in Educational Development*. 2019;(20):78-84.
14. Dong Y, Wang Q, Xing C. Progress in the relationship between positive affect and physical and mental health. *Psychological Science*. 2012;(02):487-493.
15. Wang ZH, Lyu W, Du J, et al. Relationship between College Students' positive affect and mental health: mediating effect of personal resources. *Chinese Mental Health Journal*. 2011;(07):521-527.
16. Li AM, Li XP, Gao JY, et al. Pursuing positive emotions may lead to negative consequences and their mechanisms. *Advances in Psychological Science*. 2015;(06):979-989.
17. Chen XY, Li MW. Study on Subjective Well-being and Mental Health of College Students. *Journal of Chongqing University (Social Science Edition)*. 2014;(03):178-183.
18. Joossens L, Raw M. Smuggling and cross-border shopping of tobacco in Europe. *BMJ*. 1995;(310):1393-1397.