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The Relationship between Academic Procrastination and Internet Addiction in College Students: The Multiple Mediating Effects of Intrusive Thinking and Depression-Anxiety-Stress

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Abstract

Objectives: To explore the relationship between academic procrastination and Internet addiction in contemporary college students based on the theory of limited self-control, and to investigate the multiple mediating effects of intrusive thinking, depression, anxiety and stress. **Methods:** 306 college students were investigated with the general procrastination behavior questionnaire, intrusive thinking questionnaire, DASS (anxiety-depression-Stress) scale and Internet addiction questionnaire. **Results:** 1) There were significant gender differences in the variables of intrusive thinking, mainly girls' intrusive thinking was more than boys'. Individuals with or without traumatic experience have significant differences in Internet addiction, depression, anxiety and stress, which is mainly manifested as that individuals with traumatic experience are higher than those without traumatic experience. 2) Correlation analysis showed that there was a significant positive correlation between academic procrastination, intrusive thinking, depression, anxiety, stress and Internet addiction. 3) The multiple mediating effect test showed that academic procrastination affected Internet addiction through three indirect pathways, namely, the independent mediating role of intrusive thinking, the independent mediating role of DASS, and the chain mediating role of intrusive thinking and DASS. **Conclusions:** Academic procrastination has a significant effect on Internet addiction, and this effect is formed through the multiple mediating effects of intrusive thinking and DASS.

Keywords

Academic Procrastination, Intrusive Thinking, Depression, Anxiety, Stress,

Internet Addiction

1. Introduction

With the popularization of the Internet, Internet addiction behavior is gradually increasing. Internet addiction refers to uncontrollable online behaviors under the influence of non-addictive substances, which is manifested as obvious damage to social and psychological functions of individuals due to excessive use of the Internet (Dong & Li, 2018; Zhang et al., 2021). *The 47th Statistical Report on the Development of Internet in China* (CNNIC, 2021) shows that by December 2020, the number of Internet users in China has reached 989 million, and the Internet penetration rate has reached 70.4%. The college student group has been the main force of Internet use, and is also a high-risk group for Internet addiction, and the total incidence of Internet addiction among Chinese college students is 10.7%, and the problem of Internet addiction among college students needs urgent attention (Liu et al., 2021). Therefore, it is extremely important to explore the influencing factors and mechanisms of Internet addiction.

1.1. The Influencing Factors of Internet Addiction

The research shows that there is a significant positive correlation between intrusive thinking and Internet addiction (Wei et al., 2020). Intrusive thoughts are involuntary, recurring, and irregular intrusive thoughts that enter an individual's brain, causing a range of adaptive problems and negative emotions, including anxiety, depression, and obsessive-compulsive disorder (Julien et al., 2007). Research proves that most people experience this at one time or another, and it usually comes in three forms: thoughts (e.g. fate will punish me if I don't say something), images (e.g. online game images that popped into one's head during class), and impulses (e.g. the urge to jump off a train platform). They are usually unpleasant, unwanted, irrational or unrealistic thoughts that interrupt the individual's normal thinking and are difficult to control (Magee et al., 2019). The control of intrusive thoughts can reflect the ability of individuals to suppress specific thoughts. The more intrusive thoughts an individual has, the more serious the Internet addiction behavior will be. Specifically, if an individual has too many intrusive thoughts and cannot effectively suppress or control these intrusive thoughts, the Internet addiction behavior may occur.

In addition, a large number of studies have shown that depression, social support, procrastination, social anxiety and other factors are correlated with Internet addiction (Ju et al., 2018; Osborn et al., 2020). Specifically, there is a positive correlation between depression and Internet addiction (Wang et al., 2020), irrational procrastination can positively predict students' pathological Internet use (Zhang et al., 2016), and individuals with emotional problems (such as anxiety, stress, etc.) and negative life events are more likely to indulge in the Inter-

net and have Internet addiction behavior (Samaha & Hawi, 2016; Wei et al., 2014). Therefore, perhaps we should pay more attention to students' academic procrastination, try to reduce the negative emotional impact of negative events on individuals, and then reduce students' Internet use behavior.

1.2. Adverse Consequences of Academic Procrastination

Procrastination is a typical negative event in daily life. It is an important dimension of individual psycho-social adaptation, and also an important index to measure the mental health level of college students and the quality of academic completion (Rothblum et al., 1986). Procrastination refers to the fact that individuals always or almost always finish tasks late and experience negative emotions as a result (Rothblum et al., 1986). As many as 39.7% of college students in China have obvious procrastination behaviors. 69% of college students were negatively affected by procrastination (Pang & Han, 2009). This study is aimed at college students and focuses on academic procrastination. Procrastination in this paper mainly refers to academic procrastination. Procrastination can positively predict the frequency of intrusive thinking, and individuals with procrastination are prone to rumination, compulsive thinking, redundant thinking and other phenomena (Liu, 2020; Shao et al., 2017; Chen, 2019). In addition, a large number of studies have shown that procrastination is positively correlated with negative emotions (Milgram & Toubiana, 1999; Owens & Newbegin, 2000; Wang, 2019; Wang, 2017) and procrastination is positively correlated with anxiety (Onwuegbuzie & Jiao, 2000; Zhang, 2016; Li, 2019). College students with academic procrastination have significantly lower psychosocial adaptability than ordinary individuals, and are prone to choose the Internet as a retreat and escape from reality when facing setbacks in social life, and even form Internet addiction (Chen & Lu, 2016). A large number of studies have shown that there is a positive correlation between procrastination and Internet addiction (Xue et al., 2018; Ruan, 2018; Lian et al., 2021). But few people have explored how procrastination, intrusive thinking and negative emotions of college students affect Internet addiction at the same time. Therefore, on the basis of previous studies, this study intends to explore the relationship between college students' procrastination behavior and Internet addiction, as well as the key role of intrusive thinking and negative emotions in it, in order to improve college students' time management level and self-discipline awareness, reduce negative emotions, and healthy use of Internet platform.

1.3. Theoretical Basis and Research Hypothesis

Based on the theory of limited self-control, this study examines the effects of procrastination on Internet addiction among college students and examines the multiple mediating effects of intrusive thinking and depression-anxiety-stress. The limited resource model of self-control holds that many situations and behaviors consume the power of self-control, such as emotion regulation, thought

control, impulse control and stress coping (Baumeister et al., 2007; Muraven & Baumeister, 2000; Hagger et al., 2010; Tan & Guo, 2008). First, procrastination redundant thoughts and negative emotions can result from, the individual as it will consume the power of self-control, delay in thinking, repeatedly forced thinking such as loss of self, and affect the flexibility of emotion regulation itself, not in a positive mood to deal with negative events, will produce the negative emotions such as anxiety depression stress experience and feelings (Milgram & Toubiana, 1999; Owens & Newbegin, 2000; Wang, 2019; Wang, 2017; Onwuegbuzie & Jiao, 2000; Zhang, 2016; Li, 2019). Second, suppressing intrusive thoughts can induce negative emotions. Intrusive thoughts are thoughts that often enter an individual's mind involuntarily. These thoughts are usually negative, depleting self-control resources and increasing the likelihood that negative emotions, including depression and anxiety, will be triggered (Wei et al., 2020; Rodriguez et al., 2012; Lepore et al., 1996). Finally, intrusive thinking and negative emotions have an impact on Internet addiction behavior. Limited self-control theory into thinking and negative emotions will consume the power of self-control, self-control and development is closely related to adapt to, Internet addiction behavior have a certain adaptability, it is associated with stress response (Zhang et al., 2019). According to the theory into the thinking and negative emotions development to adapt to the problem by power consumption of self-control, self-control failure increases with Internet addiction tendencies. A large number of studies have found that there is a positive correlation between pressure and Internet addiction, and individuals with greater pressure are more likely to become addicted. A large number of studies have found that there is a positive correlation between pressure and Internet addiction, and individuals with greater pressure are more likely to become addicted (Leung et al., 2007; Li et al., 2009; Niu et al., 2016; Ye & Zheng, 2016). To sum up, this study proposed the hypothesis that procrastination affects individual Internet addiction behavior through the multiple mediating effects of intrusive thinking and depression-anxiety-stress.

2. The Research Methods

2.1. The Research Object

Convenient sampling was adopted to select college students from a university in Xinyang City as the subjects, and a total of 316 questionnaires were issued. After removing invalid questionnaires, 306 valid questionnaires were collected, with an average age of 19.15 ± 0.07 years old. The effective rate of questionnaire recovery was 96.84%. Among them, 122 (39.87%) were male and 184 (60.13%) were female; 119 students (38.89%) majored in literature, history and finance, 176 students (57.52%) majored in science and medicine, 11 students (3.60%) majored in art and sports. The rural population is 168 (54.90%), and the urban population is 138 (45.10%). 85 (27.78%) had traumatic experience and 221 (72.22%) had no traumatic experience.

2.2. Research Tools

2.2.1. Internet Addiction Scale

The Internet Addiction Scale prepared by Young and Rogers (1998) was adopted. There are 8 items in the scale and the score is 6 points. The higher the score is, the higher the degree of Internet addiction is. The internal consistency coefficient α of the scale in this study was 0.87.

2.2.2. White Bear Suppression Inventory (WBSI)

The Thought Suppression Questionnaire (Rodriguez et al., 2012) consists of 15 items, which are divided into 3 subscales: intrusive thinking (8 items), thought suppression (4 items) and attention diversion (3 items). A Likert scale of 5 was used, ranging from "strongly disagree" to "strongly agree" on a scale of 1 - 5. A higher score indicates more intrusive thinking. The internal consistency coefficient α of the scale in this study was 0.87.

2.2.3. Depression-Anxiety-Stress Self-Rating Scale

DASS-21 simplified Chinese Version (Gong et al., 2010). The assessment included 3 subscales of depression, anxiety and stress, each subscale containing 7 items, a total of 21 items. The degree of DASS experience of depression, anxiety and stress in recent "1 week" was investigated, such as "I feel depressed" and "I feel thirsty". Likert self-rating 4-point scoring method is adopted, "0" means "never", "1" means "occasionally", "2" means "often", and "3" means "always". The final score is obtained by multiplying the sum of scores of each subscale by 2. The higher the score is, the worse the psychological state and the more serious DASS symptoms are. In this study, the internal consistency coefficients α of depression subscale, anxiety subscale, stress subscale and total DASS subscale were 0.84, 0.78, 0.81 and 0.92, respectively.

2.2.4. Short General Procrastination Scale

The Short General Procrastination Scale (SGPS) was translated and revised by Zhang et al. (2020) on the basis of the general procrastination scale. It can be used to measure the tendency and severity of college students' academic procrastination, with topics such as "I often say I will do it tomorrow" and "I usually finish tasks ahead of schedule". SGPS consists of 9 questions and is a single dimension test, among which 3 questions are scored backwards. Questions are scored by Likert 5 points (strongly disagree ~ strongly agree). A higher score indicates a greater tendency to academic procrastinate. The internal consistency coefficient α of the scale in this study was 0.81.

2.3. Test Procedures

All the researchers in this survey are post-graduate students majoring in psychology who have undergone rigorous training. The informed consent of relevant school leaders, teachers and students was obtained before the test. The method of convenient sampling and anonymous filling was adopted to select stu-

dents from 3 grades and 4 classes for testing. The participants were required to complete independently and answer truthfully. During the process of filling in, if the participants have any questions, they can inform the researchers. On the premise of not affecting others to fill in, the researchers answer the questions quietly on the spot. After the participants completed the questionnaire independently, the questionnaires were collected on the spot. There was no unnecessary communication between the experimenters and the participants during the whole process. It takes about 20 minutes for participants to complete the entire questionnaire. After completing the questionnaire, each student were paid 5 RMB. With the consent of the students in the class, all payments were transferred to the class monitor via WeChat. The collected data were strictly checked by the experimenters and the questionnaires that were missed and illogical were eliminated.

2.4. The Data Processing

After data collection and input, SPSS 21.0 software was used for statistical analysis. T test or analysis of variance was used to compare the procrastination behavior, intrusive thinking, Internet addiction and DASS score of students of different genders and with or without traumatic experience. Pearson correlation analysis was used for the correlation between the general procrastination Behavior Scale, intrusive thinking questionnaire, Internet Addiction Scale and the scores of depression, anxiety and stress subscales. Model 6 of Bootstrap method proposed by Hayes was used to test and analyze the significance level of the mediation effect.

2.5. Common Method Bias

Harman single-factor test was used to test common method bias. The results showed that there were 11 factors with characteristic roots greater than 1, among which the variation explained by the first factor was 23.21%, less than the critical value of 40% (Podsakoff et al., 2003), indicating that there was no serious common method bias in this study.

3. Results

3.1. The General Situation of Internet Addiction, Intrusive Thinking, DASS and Procrastination

Among the 306 college students surveyed, 72 (23.53%) had moderate Internet addiction, and 9 (2.94%) had severe Internet addiction. 67 (21.90%) had moderate depression, 22 (7.19%) had severe depression, and 11 (3.59%) had very severe depression. 72 (23.53%) had moderate anxiety, 37 (12.09%) had severe anxiety, and 32 (10.46%) had very serious anxiety. 41 (13.40%) had moderate stress problems, 22 (7.19%) had more serious stress problems, and 2 (0.65%) had very serious stress problems; 174 (56.86%) had moderate procrastination, and 21 (6.86%) had severe procrastination.

The independent sample T-test was conducted with gender and the presence of traumatic experience as independent variables and Internet addiction, intrusive thinking, DASS and procrastination as dependent variables, and the results are shown in Table 1.

As can be seen from Table 1, there is a significant edge difference between boys and girls in anxiety dimension, which is mainly manifested as boys are higher than girls ($p = 0.05$). There was a significant difference between male and female students in the variables of intrusive thinking, which was mainly reflected that female students had more intrusive thinking than male students ($p < 0.01$). There were significant differences in Internet addiction, depression, anxiety and stress between individuals with and without traumatic experience. The degree of Internet addiction ($p < 0.05$), depression ($p < 0.01$), anxiety ($p < 0.01$) and stress ($p < 0.001$) of individuals with traumatic experience were higher than that of individuals without traumatic experience. There was a significant marginal difference between individuals with and without traumatic experience in the variables of intrusive thinking, which was mainly reflected in that individuals with traumatic experience had more intrusive thinking than individuals without traumatic experience ($p = 0.078$).

3.2. Correlation Analysis of Internet Addiction, Intrusive Thinking, DASS and Procrastination Behavior

Correlation analysis was conducted on 7 variables including academic procrastination behavior, Internet addiction, intrusive thinking, DASS total score and depression, anxiety and stress subscales, and specific results are shown in Table 2.

The results showed that procrastination behavior, intrusive thinking, depression-anxiety-stress were positively correlated with Internet addiction ($p < 0.001$), while procrastination behavior was positively correlated with intrusive thinking ($p < 0.01$), depression-anxiety-stress ($p < 0.001$). These results provide the basis for testing the mediating effect.

Table 1. Comparison of demographic characteristics of all variables ($M \pm SD$).

Dependent variable	Male (n = 122)	Female (n = 184)	t	Yes (n = 185)	None (n = 221)	t
Internet addiction	23.02 ± 8.13	22.50 ± 7.87	0.56	24.41 ± 8.17	22.05 ± 7.80	2.34*
WBSI	50.84 ± 8.91	53.55 ± 7.81	−2.74**	53.82 ± 8.73	51.95 ± 8.17	1.77
Depression	11.02 ± 8.29	9.86 ± 7.48	1.27	12.68 ± 8.00	9.41 ± 7.57	3.33**
Anxiety	10.49 ± 6.88	8.99 ± 6.47	1.94	11.67 ± 7.28	8.79 ± 6.25	3.45**
Pressure	13.59 ± 7.90	12.50 ± 7.49	1.22	15.74 ± 7.96	11.86 ± 7.27	4.08***
Total DASS	35.10 ± 21.22	31.35 ± 19.64	1.58	40.09 ± 21.16	30.05 ± 19.34	3.96***
SGPS	26.63 ± 5.79	26.53 ± 5.58	0.15	26.68 ± 5.63	26.53 ± 5.68	0.21

Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, same below.

Table 2. Correlation matrix between procrastination, intrusive thinking, DASS and Internet addiction.

Project	$M \pm SD$	1	2	3	4	5	6
1	26.57 ± 5.66	—					
2	22.71 ± 7.97	0.50***	—				
3	10.32 ± 7.82	0.35***	0.47***	—			
4	9.59 ± 6.67	0.31***	0.48***	0.75***	—		
5	12.93 ± 7.66	0.24***	0.47***	0.75***	0.80***	—	
6	32.84 ± 20.33	0.32***	0.51***	0.91***	0.92***	0.93***	—
7	52.47 ± 8.36	0.18**	0.31***	0.32***	0.29***	0.36***	0.35***

Note: 1 = academic procrastination; 2 = Internet addiction; 3 = depression; 4 = anxiety; 5 = pressure; 6 = DASS; 7 = Intrusive thinking.

3.3. Mediation Effect Test

Bootstrap method of mediating effect test proposed by Hayes was adopted, and the Model6 mediation model (Hayes, 2017) was adopted to repeat 5000 times of sampling. Under the condition of controlling gender and traumatic experience, a 95% confidence interval was calculated to test the mediating effect of intrusive thinking and DASS on college students' procrastination behavior and Internet addiction. The results showed that procrastination significantly positively predicted intrusive thinking ($\beta = 0.18$, $p < 0.01$) and DASS ($\beta = 0.27$, $p < 0.001$). Intrusive thinking positively predicted DASS ($\beta = 0.31$, $p < 0.001$). Procrastination ($\beta = 0.36$, $p < 0.001$), intrusive thinking ($\beta = 0.13$, $p < 0.05$) and DASS ($\beta = 0.34$, $p < 0.001$) could still significantly positively predict Internet addiction when procrastination, intrusive thinking and DASS entered the regression equation. And the confidence interval of the mediation effect does not include 0 (see **Table 3** and **Table 4** for details).

As shown in **Table 4**, bias correction non-parametric percentile Bootstrap method was used to further test the mediating effect. The results showed that intrusive thinking and DASS had significant mediating effects, with a mediating effect value of 0.13. Specifically, the mediating effect was generated through three mediating chains: first, the indirect effect 1 (0.02) consisting of procrastination, intrusive thinking and Internet addiction, and the Bootstrap 95% confidence interval did not contain 0, indicating that intrusive thinking had a significant mediating effect; Second, the indirect effect 2 (0.02) was composed of procrastination → intrusive thinking → DASS → Internet addiction, and the Bootstrap 95% confidence interval did not include 0, indicating that intrusive thinking and DASS had a significant chain mediating effect between procrastination and Internet addiction. Third, the indirect effect of procrastination → DASS → Internet addiction was 3 (0.09), and the Bootstrap 95% confidence interval did not contain 0, indicating that DASS had a significant mediating effect. The specific path of the effect of college students' procrastination on Internet addiction is shown in the attached (**Figure 1**).

Table 3. Regression analysis of variable relationships in the mediation model.

The regression equation		Overall fitting index			Significance of regression coefficient	
The results of variable	Predictor variable	R	R^2	F	β	t
Internet addiction	Gender	0.51	0.27	31.79***	−0.03	−0.32
	Traumatic experiences				−0.28	−2.40*
	Procrastination				0.50	9.48***
WBSI	Gender	0.27	0.07	6.57**	0.35	2.94**
	Traumatic experiences				−0.26	−1.88
	Procrastination				0.18	3.07**
DASS	Gender	0.50	0.25	22.82***	−0.25	−2.32*
	Traumatic experiences				−0.39	−3.41**
	WBSI				0.31	5.80***
	Procrastination				0.27	5.17***
Internet addiction	Gender	0.63	0.40	34.83***	−0.03	−0.30
	Traumatic experiences				−0.09	−0.81
	WBSI				0.13	2.33*
	DASS				0.34	6.21***
	Procrastination				0.36	7.03***

Note: All variables in the model were standardized before being put into the equation.

Table 4. Mediation effect test results.

Path	Effect Size	Bootstrap SE	Bootstrap (95% CI)	Relative Effect Quantity
Total effect	0.50	0.05	[0.39, 0.60]	
Direct effects	0.36	0.05	[0.26, 0.47]	73.39%
Total indirect effect	0.13	0.03	[0.09, 0.19]	26.61%
Indirect effects1	0.02	0.01	[0.01, 0.06]	4.64%
Indirect effects2	0.02	0.01	[0.01, 0.04]	3.83%
Indirect effects3	0.09	0.02	[0.06, 0.14]	18.35%

Note: When the subscales of depression, anxiety and stress were analyzed separately, the mediating effect was significant. Therefore, the total DASS scale was taken as one of the mediating variables to investigate the indirect effect of procrastination on Internet addiction. Boot standard error, Boot CI lower limit and Boot CI upper limit refer to the standard error of indirect effects estimated by the percentile Bootstrap method with bias correction, and the lower limit and upper limit of 95% confidence interval respectively.

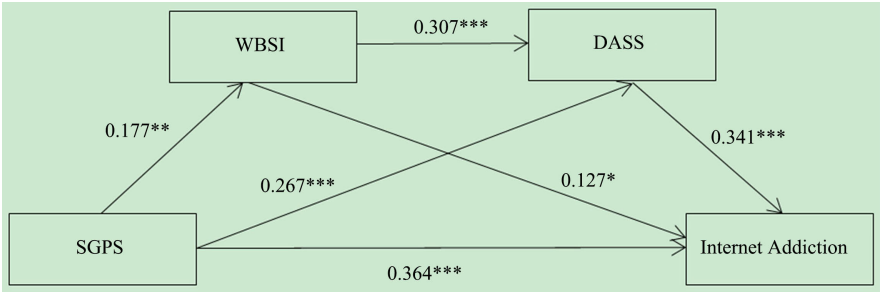

Figure 1. Diagram of chain mediation action.

4. Discussion

The survey found that Internet addiction behavior of college students is higher detection rate, analysis the reason may be the ability of the college students' time management and lacking self-discipline consciousness, it is difficult to resist from the era of digital virtual network platform of the temptation of extraneous stimulus, relatively free life environment compared to high school and university period, Without direct supervision and guidance from parents or teachers, some students lack the environmental foundation for long-term exercise of self-control ability, and do not develop good living habits. In the same way, the inhibition as a direct result of the derivatives of procrastination, procrastination behavior detection rate is higher, the questionnaire seems to delay has become a kind of common phenomenon of college students, caused by delay of negative emotions (depression, anxiety, stress) also illustrates the problem, the more delay, the more anxious, more want to indulge in the network world, A vicious cycle in which the final task is postponed.

4.1. The Influence of Procrastination on Internet Addiction

This study found that procrastination can significantly positively predict Internet addiction, the findings are consistent with previous studies, as stated earlier, there are also many studies that have shown that Internet addiction is correlation with procrastination (Xue et al., 2018; Ruan, 2018; Lian et al., 2021), these findings suggest that procrastination and Internet addiction exist mutual prediction and proof of relationship, based on the results of this article, The positive predictive relationship between procrastination behavior and Internet addiction was confirmed and supplemented. At the same time, based on the theory of limited self-control, procrastination itself is a kind of self-control ability, which also caused a series of self-control problems, which are particularly that individuals in the continuous self-control, self-control in front of experience will affect the performance of self-control behind (Tan & Guo, 2008), including the mind control aftereffect cope with the pressure, emotional adjustment after effect and after effect and so on. In particular, the mind control aftereffect individual conscious that suppress myself not to think about one thing, and this kind of operation is obviously taking self-control, studies have shown that let the participants avoid think of an object then let the participants watch comedy movies and asked participants suppress their emotional responses, the results showed that the experimental group was who control group was made more laughter (Muraven et al., 1998). It was clear that the control of previously suppressed thoughts left the subjects with insufficient resources to complete the later emotional task. Meanwhile, regulating emotions is also a process of self-control. When individuals cannot flexibly adjust to negative emotions (depression, anxiety and pressure) caused by thinking repression, problems of development and adaptability will occur, namely Internet addiction behavior.

4.2. The Multiple Mediating Effects of Intrusive Thinking and DASS (Depression-Anxiety-Stress)

This study examined the mediating effect of intrusive thinking and DASS on procrastination and Internet addiction by controlling for gender and the presence or absence of traumatic experience, and the results showed that the influence of procrastination on Internet addiction plays a role through three indirect pathways: Independent mediation through intrusive thinking, independent mediation through DASS, and chain mediation through intrusive thinking and DASS. In this study, intrusive thinking and depression-anxiety-stress jointly play a role in Internet addiction, that is, procrastination will lead to problems in thinking control and emotional regulation. According to previous studies, procrastination will also have a negative impact on individual physical health, such as stress experience, irregular eating, insomnia, etc. (Zhang et al., 2016; Ni et al., 2012). The revelation we relieve teenagers Internet addiction problems need to consider many aspects, not only need to wait like distracting, cognitive reappraisal of emotion regulation strategies to weaken the negative influence of negative emotions, you also need to must pay attention to the training of technology (Nassif & Wells, 2014), through long time progressive training operation reduce the frequency of individuals into sex thinking, in addition to this, Students themselves can make time plans and stick to them by means of scientific guidance or supervision of others, so as to cultivate the good habit of completing tasks with high quality within the specified time and reduce the possibility of procrastination from the root. Combined with the above means, it can effectively promote students to use Internet tools rationally, arrange online time rationally, filter Internet content positively, and slow down or even eliminate the negative effects of Internet addiction. The above work not only requires students to have the consciousness of consciously changing the status quo, but also requires the practical implementation of relevant university staff, and even the atmosphere of optimizing the network platform of the whole social environment. In today's rapid development of digital process, there is a long way to go, but also has its realization significance and necessity.

4.3. Educational Suggestions

Taking Internet addiction behavior as the entry point, this study found that academic procrastination, the frequency of individual intrusive thinking and the generation of multiple negative emotions may increase students' Internet addiction behavior, and play a significant multiple mediating role. The results of this study can enlighten the educational staff in colleges and universities. The education should not only focus on daily teaching, but also involve the power of mental health education and add corresponding mental health education courses. As the saying goes: "to teach fishing is better than teach them to fish", in the face of the students' negative emotions, do a qualified education workers in colleges and universities should not only comfort, listener, channel, should teach students

more reasonable use of all kinds of emotion regulation strategies, strengthening self-discipline consciousness education, make students adapt to the rhythm of the self-control, improving individual mental flexibility. An individual with strong self-control will be able to plan his study life more rationally, will not experience frustration due to repeated delays, will not be subject to those sudden intrusions of negative thoughts, and will not suffer excess burden and pain due to mental and emotional rigidity, and will not need to escape from reality by indulging in the Internet. Instead, they can take the initiative to manage and create their own lives with an ownership attitude and accept the hardships in life with an open attitude. If it can help more students who are in the confusion and wandering, that would be the value of this study.

4.4. Limitations and Prospects

This study has some limitations. First, this study only discussed the effects of procrastination, intrusive thinking, depression-anxiety-stress on Internet addiction, and did not involve intervention and regulation measures. Future studies may consider the moderating effect of cognitive reevaluation or the protective effect of mindfulness. Secondly, although this study supplements the effects of procrastination on thinking control and emotion regulation to some extent, there is a lack of longitudinal studies on these two aspects. Longitudinal tracking and certain intervention methods can be used to test the theoretical model established in this study in the future. Finally, the variables involved in this study, such as academic procrastination behavior and Internet addiction, are not only limited to college students, but also exist in primary and secondary schools. Future studies can try to broaden the scope of subjects and test the applicability of the theoretical model in different age groups.

5. Conclusion

Based on the theory of limited self-control, this study explores the relationship between contemporary college students' general procrastination behavior and Internet addiction, and examines the multiple mediating effects of intrusive thinking, depression, anxiety and stress. 306 college students were investigated with the general procrastination behavior questionnaire, intrusive thinking questionnaire, DASS (anxiety-depression-stress) scale and Internet addiction questionnaire. The results show that: 1) There is a significant gender difference in the variables of intrusive thinking, mainly showing that girls have more intrusive thinking than boys; Individuals with or without traumatic experience have significant differences in Internet addiction, depression, anxiety and stress, which is mainly manifested as that individuals with traumatic experience are higher than those without traumatic experience. 2) Correlation analysis showed that there was a significant positive correlation between procrastination, intrusive thinking, depression, anxiety, stress and Internet addiction. 3) The multiple mediating effect test showed that procrastination affected Internet addiction

through three indirect pathways, namely, the independent mediating role of intrusive thinking, the independent mediating role of DASS, and the chain mediating role of intrusive thinking and DASS. Conclusion: Procrastination has a significant effect on Internet addiction, and this effect is formed through the multiple mediating effects of intrusive thinking and DASS.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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