



Faculty of Cognitive Sciences and Human Development

**The Relationship between Negative Life Events and Cell Phone Addiction
among College Students: Examining the Mediating Roles of Perceived
Social Support, Social Avoidance, and Mindfulness**

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The Relationship between Negative Life Events and Cell Phone Addiction
among College Students: Examining the Mediating Roles of Perceived Social
Support, Social Avoidance, and Mindfulness

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A thesis submitted

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

This study regarded college students as the research object, regarded negative life events (NLE) as the independent variable, regarded cell phone addiction (CPA) as the dependent variable, regarded social avoidance (SA), perceived social support (PSS) and mindfulness level (ML) as mediate variables, and tried to build a multiple - mediation model on NLE, ML, SA, PSS and CPA. The survey sample in this study included four - hundred and seventy - three (473) college students. SPSS 27.0 was used to conduct Descriptive Statistical Analysis, Pearson Product - Moment Coefficient and Analysis on the collected data, and Amos 26.0 was used to test the structural equation model. The results of the study were presented below. (1) NLE had a positive predictive effect on CPA. NLE were positively related to SA and ML. NLE were negatively related to PSS. SA, ML and CPA showed positive relationships. PSS was negatively related to CPA. (2) ML played a mediating role in the influence of NLE on CPA. SA played a mediating role in the influence of NLE on CPA. (3) ML and SA played a mediating role in the influence of NLE on CPA. All in all, NLE could directly predict CPA in a positive way. After introducing ML, PSS and SA into the analytical model, it was found that NLE had a side - by - side effect through ML and SA, and further affected CPA. The significance of this study could be expounded from two facets. From the theoretical facet, the research outcomes facilitated the augmentation of the theory. Theoretically expounded, this study broadened the influence of NLE on CPA from a plain issue to a matter of mediating effects, encompassing ML, PSS and SA. From the practical significance perspective, the research results demonstrated that ML and SA had significant mediating roles in the effect of NLE on CPA. This discovery was conducive for school administrators in overseeing, governing and practicing with respect to students' CPA phenomenon. Future researchers might suggest: (1) Increasing sample representativeness;

(2) Appropriately increasing cases and longitudinal follow - up studies; (3) Expanding the sample size.

Keywords: Negative life events, mindfulness level, social avoidance, perceived social support, cell phone addiction

***Hubungan antara Peristiwa Kehidupan Negatif dan Ketagihan Telefon Bimbit di
Kalangan Pelajar Kolej: Mengkaji Peranan Pengantara Sokongan Sosial yang
Dirasakan, Pengelakan Sosial dan Kesedaran***

ABSTRAK

Kajian ini menganggap pelajar kolej sebagai objek penyelidikan, menganggap peristiwa kehidupan negatif sebagai pembolehubah bebas, menganggap ketagihan telefon bimbit sebagai pembolehubah bergantung, menganggap pengelakan sosial, sokongan sosial yang dirasakan dan tahap kesedaran sebagai pembolehubah pengantara, dan cuba membina model pengantaraan pelbagai pada peristiwa kehidupan negatif, tahap kesedaran, pengelakan sosial, sokongan sosial yang dirasakan dan ketagihan telefon bimbit. Sampel tinjauan dalam kajian ini termasuk empat ratus tujuh puluh tiga pelajar kolej. SPSS 27.0 digunakan untuk menjalankan Analisis Statistik Deskriptif, Pekali Produk Pearson - Pekali Momen dan Analisis pada data yang dikumpul, dan Amos 26.0 digunakan untuk menguji model persamaan struktur. Hasil kajian telah dibentangkan di bawah. (1) Peristiwa kehidupan negatif mempunyai kesan ramalan positif terhadap ketagihan telefon bimbit. Peristiwa kehidupan negatif berkaitan positif dengan tahap pengelakan sosial dan kesedaran. Peristiwa kehidupan negatif berkaitan secara negatif dengan sokongan sosial yang dirasakan. Pengelakan sosial, tahap kesedaran dan ketagihan telefon bimbit menunjukkan hubungan positif. Sokongan sosial yang dirasakan berkaitan secara negatif dengan ketagihan telefon bimbit. (2) Tahap kesedaran memainkan peranan pengantara dalam pengaruh peristiwa kehidupan negatif terhadap ketagihan telefon bimbit. Pengelakan sosial memainkan peranan pengantara dalam pengaruh peristiwa kehidupan negatif terhadap ketagihan telefon bimbit. (3) Tahap kesedaran dan pengelakan sosial memainkan peranan pengantara dalam pengaruh peristiwa kehidupan negatif terhadap ketagihan telefon bimbit. Secara keseluruhannya, peristiwa kehidupan negatif secara langsung boleh

meramalkan ketagihan telefon bimbit dengan cara yang positif. Selepas memperkenalkan tahap kesedaran, sokongan sosial yang dirasakan dan SA ke dalam model analisis, didapati bahawa peristiwa kehidupan negatif mempunyai kesan sampingan melalui tahap kesedaran dan pengelakan sosial, dan seterusnya menjejaskan ketagihan telefon bimbit. Kepentingan kajian ini boleh dijelaskan daripada dua aspek. Dari aspek teori, hasil penyelidikan memudahkan penambahan teori. Secara teorinya dijelaskan, kajian ini meluaskan pengaruh peristiwa kehidupan negatif terhadap ketagihan telefon bimbit daripada isu biasa kepada perkara kesan pengantaraan, merangkumi tahap kesedaran, sokongan sosial yang dirasakan dan pengelakan sosial. Dari perspektif kepentingan praktikal, hasil penyelidikan menunjukkan bahawa tahap kesedaran dan pengelakan sosial mempunyai peranan pengantara yang penting dalam kesan peristiwa kehidupan negatif terhadap ketagihan telefon bimbit. Penemuan ini kondusif bagi pentadbir sekolah dalam mengawasi, mentadbir dan mengamalkan berkenaan dengan fenomena ketagihan telefon bimbit pelajar. Penyelidik masa depan mungkin mencadangkan: (1) Meningkatkan perwakilan sampel; (2) Peningkatan kes dan kajian susulan membujur dengan sewajarnya; (3) Memperluaskan saiz sampel.

Kata kunci: *Peristiwa kehidupan negatif, tahap kesedaran, pengelakan sosial, sokongan sosial yang dirasakan, ketagihan telefon bimbit*

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LIST OF ABBREVIATIONS

ADF	Art and Design Faculty
AEF	Architectural Engineering Faculty
AGFI	Adjusted Goodness of Fit Index
ASLEC	Adolescent Self-Rating Life Events Checklist
CFI	Comparative Fit Index
CPA	Cell Phone Addiction
CPAI	Cell Phone Addiction Inventory
FFMQ	The Five Factor Mindfulness Questionnaire
FMI	The Freiburg Mindfulness Inventory
FNE	Fear of Negative Evaluation Scale
GFI	Goodness of Fit Index
IAS	Interaction Anxiety Scale
IBF	International Business Faculty
ICEF	Information and Control Engineering Faculty
IFI	Incremental Fit Index
KMS	The Kentucky Inventory of Mindfulness Skills
LEC	Life Events Checklist
LES	Life Events Scale
MAAS	The Mindful Attention Awareness Scale
MEF	Management Engineering Faculty
ML	Mindfulness Level
MPAI	Mobile Phone Addiction Index

MPATS	Mobile Phone Addiction Tendency Scale of College Students
NFI	Normed Fit Index
NLE	Negative Life Events
NRI	Network of Relationships Inventory
PIRLE	The Paykels Interview for Recent Life Events
PMPUQ	Problem Mobile Phone Use Questionnaire
PMPUS	Problem Mobile Phone Use Scale
PSS	Perceived Social Support
PSSS	Perceived Social Support Scale
RMSEA	Root Mean Square Error of Approximation
SA	Social Avoidance
SADS	SA and Distress Scale
SAPS	Smartphone Addiction Proneness Scale for Adolescents
SAS	Smartphone Addiction Scale
SASC	SA Scale for Children
SMS	The State Mindfulness Scale
SRRS	Social Read Justment Rating Scale
SSQ	Social Support Questionnaire
SSRS	Social Support Revalued Scale
TMS	The Toronto Mindfulness Scale
UNIMAS	Universiti Malaysia Sarawak

CHAPTER 1

INTRODUCTION

1.1 Overview

The purpose of this study was to investigate the relationship of NLE, CPA, PSS, SA and ML among college students. In a word, this study regarded college students as the research object, regarded NLE as the independent variable, regarded CPA as the dependent variable, regarded SA, PSS and mindfulness as mediate variables, and tried to build a multiple - mediation model on NLE, mindfulness, SA, PSS and CPA. This chapter covered all the related important sections comprehensively: background of the study, problem statements, research objectives, etc.

1.2 Background of the Study

In recent years, with the rapid development of China's economy, a variety of smart terminal devices rapidly rose, especially smart devices represented by mobile phones became one of the important ways for many netizens to enter the Internet world, and gradually became one of the indispensable tools. According to the 48th Statistical Report on the Development of Internet in China (Center, 2025), by December 2024, the number of mobile Internet users in China had reached 1.105 billion, an increase of 40 million compared with March 2022. The proportion of Chinese netizens using mobile phones to access the Internet had reached 99.7 percent, up 0.4 percentage points from March 2020. Among these Chinese netizens, the proportion of Chinese students using mobile phones to access the Internet was as high as 26.9 percent (Li et al., 2021). Wang et al. (2015) conducted a questionnaire survey on mobile phone addiction among university students, and the research results showed that 37.9 percent of the students had mobile phone addiction behavior. As national builders and

future successors, college students shouldered huge responsibilities and bore different psychological and social pressures. According to the compensatory Internet Use Theory (Liu et al., 2016), Problematic Mobile Phone Usage Path Model (Billieux, 2012) and Media Dependency Theory (Ball - Rokeach and Defleur, 1976), in order to escape the physical and mental discomfort caused by various pressures at that time, college students might use mobile phones to gain psychological comfort through the network media and increased their use of mobile phones. However, college students were in the construction stage of cognitive development, and their self - control was poor (Young, 2004). Faced with smart devices such as mobile phones, college students were more likely to become dependent on them. Although mobile phones made our daily life, interpersonal communication, shopping, entertainment, leisure and other aspects more convenient, the inappropriate use of mobile phones also brought great trouble to the physical, psychological (Rizeq et al., 2025) and social life of college students. On the one hand, excessive use of mobile phones would not only affect the human nervous system, but also result in a decline in the body's immunity, leading to a series of human physical diseases, such as dry eye, tenosynovitis, cervical spondylosis and so on. On the other hand, excessive use of mobile phones could also lead to many psychological problems (Liu et al., 2025) of some people, such as low self - esteem, inner loneliness and reduced self - control (Zhang, 2025). Furthermore, immoderate use of mobile phones would also affect personal social interaction and lead to problems such as indifference in interpersonal communication among college students.

Selye (1976) believed that the most common life events of individuals were the stressors that could affect and stimulate the individual's stress response, which could further lead to the individual's cognitive imbalance and different kinds of emotional experience, and might cause great harm to the individual's physical and mental health. Chinese scholar Li

(2008) further divided life events into positive life events and NLE. Among them, NLE could lead to negative emotional experiences and feelings, such as irritability, anxiety (Zilmer et al., 2025) and restlessness. College students' NLE referred to the specific events in college students' learning environment of life and social practice and that they could be aware of as threatening stimulus events. These stimulus events could further change students' existing habits and behavior patterns, and also had a certain negative impact on college students' cognition, emotion and behavior abilities. Zhao and Chen (2010) had proved that the common NLE of college students mainly fell into seven categories: examination, interpersonal relationship, academic future, life adaptation, heterosexual communication, self - actualization and support from relatives and friends. In terms of the frequency of occurrence, interpersonal communication disorders, exam failure, learning problems and lovelorn accounted for the highest proportion. According to the grade of students, interpersonal relationship was the most common negative life event in juniors, and life maladjustment was the most common negative life event in freshmen. Studies (Gao, 2018) had shown that college students' NLE were closely related to their mental health. If the number of NLE in college students exceeded nine, the adverse symptoms of mental health would increase significantly, leading to the decrease of self - evaluation of college students and the occurrence of self - doubt, self - denial and even self - accusation (Gao, 2018). At the same time, college students' NLE would further cause individual mood swings, decline in academic performance, decrease in quality of life, and seriously threaten individual physical and mental health (Fu, 2018).

Preceding studies (Zhou et al., 2022) had shown that NLE could significantly predict CPA. According to the psychological stress system model (Jiang, 2004; Wu et al., 2001), NLE were the stressors in this model, and CPA was the stress response. There might be some

mediating factors between NLE and CPA. NLE reflected the stress process by acting on these mediating variables, and then affected the individual's CPA behavior.

Interpersonal communication (Liu et al., 2013) was an essential part of the mental health development and growth process of college students, and a good interpersonal relationship was conducive to the smooth completion of college students' self - identity. However, today, with the rapid development of society, more and more students were growing up physically and psychologically and gradually maturing mentally, and some of them had a series of problems in the progress of social communication. Social avoidance was a common bad behavior and psychological problem in the process of interpersonal communication among college students. In order to avoid the physical and psychological discomfort caused by social interaction, some college students felt distressed and even appeared social avoidance in the process of social interaction. Social avoidance (Watson and Friend, 1970) referred to the situation in which people paid more attention to others' comments on their speech and behavior, or suffered from physical and psychological discomfort in the process of communication. Then individuals would have an unhealthy external behavior and internal psychology of avoiding communication and fear of rejection. Hu et al. (2021) had shown that the total score of SA and distress of college students in science and technology colleges was higher than the norm, which had a negative impact on the individual's study and life. According to the dominant perspective theory (Wang et al., 2021), when an individual encountered a stressor, regarded the stressful event as a difficult or insurmountable gap, and did not receive positive attention and social support from others, then the individual would appear SA (Li et al., 2025). On the contrary, when individuals encountered stressful events, they regarded stressful events as challenges or opportunities and bravely faced NLE, then individuals would not have SA or their SA behaviors would be

alleviated. And previous studies (Huang et al., 2013) had shown that NLE were positively correlated with SA.

There were many studies on social support in academic fields. At that time, domestic and foreign scholars divided social support into two categories. One was the objective and practical support, which was called actual social support. The other type referred to the support that individuals felt subjectively, which was called subjective social support. Among them, subjective social support was also known as PSS. It referred to the subjective perception and feelings that individuals felt in relation to their friends, family and others (Dahlem et al., 1991). According to the Main Effect Model (Tiegs, 2010), social support (Onu et al., 2025) could buffer the negative impact of NLE on the physical and psychological aspects, and then made the individual's physical and psychological development move toward a healthy direction. SA, as a kind of negative psychology and behavior, could promote the physical and mental development of individuals toward health under the role of social support (Song et al., 2020). For college students under psychological and physical development at that time, if individuals felt effective social support, it was helpful to alleviate their Internet addiction behaviors (Tu, 2016). Studies had shown that social support (Wang et al., 2021) and SA (Ye et al., 2017) were important factors affecting CPA. And social support (Ylmaz et al., 2025) played a crucial role in SA. Therefore, it could be inferred that social support could affect the SA of individuals in the face of NLE, and further affect the CPA behavior of individuals.

In recent years, mindfulness had sprung up rapidly in many fields such as medicine and psychology at home and abroad. Mindfulness (Kabat - Zinn, 2010) was a conscious, purposeful, non - judgmental acceptance of what was happening in the present moment, and

a clear awareness of what was happening in the present moment. Teng et al. (2017) conducted a survey on 2,792 freshmen in a medical college to explore the relationship between mindfulness and NLE, depression and sleep quality. The research results showed that mindfulness and sleep quality played a chain mediating role between NLE and depression. Many studies had shown that mindfulness not only played an important role in regulating the physical and mental health of individuals, but also that mindfulness training was conducive to the improvement of individual negative emotions and behaviors. For example, mindfulness traits could modulate an individual's self - esteem (Xv, 2022), anger (Xu et al., 2017), social avoidance (Xiong, 2016; Wu et al., 2025), perceived social support (Li et al., 2020) and other aspects. At the same time, mindfulness intervention could have certain positive effects on insomnia (Tao et al., 2017), negative emotions (Yu et al., 2019) and cell phone addiction (Zhang & Zhu, 2014). Studies had shown (Peng et al., 2023) that a high level of mindfulness might cause an individual to give more heed to the use of various mobile phone software and be immersed in the present state. Such unconscious attention preference and attention detachment difficulties would lead to serious mobile phone addiction, which would further lead to college students' dependence on mobile phones. Although previous studies (Gülden et al., 2024) had shown that mindfulness intervention could reduce CPA, a high level of mindfulness might cause an individual to attach greater importance to the use of various mobile phone software and the mechanism by which mindfulness impacted CPA was still under exploration. Previous studies related to mindfulness had found that most of the studies on mindfulness were empirical studies on mindfulness intervention, and few scholars had explored the mechanism of action between mindfulness and CPA. At that time, the relationship between two or three of the five variables, including NLE, ML, PSS, SA and CPA, had been mostly studied in China, while

the relationship between the five variables was rarely studied directly. According to the psychological stress system model, NLE were the stressors in this model, and CPA was the stress response. There might be some mediating factors between NLE and CPA. Through literature review, mindfulness, PSS and SA could be used as intermediate factors in this model. Therefore, this study took college students as the research object, with NLE as the independent variable, CPA as the dependent variable, and mindfulness, PSS and SA as the mediating variables, and tried to build a multiple - mediation model among the five variables of NLE, ML, PSS, SA and CPA. In order to find out the ways to ease college students' CPA and to provide more possible solutions and suggestions for the improvement of CPA among college students.

1.3 Problem Statement

Wang et al. (2015) conducted a questionnaire survey, and the research results showed that 37.9 percent of the students had mobile phone addiction behavior. Zhou et al. (2022) firmly believed that NLE could significantly predict CPA. And Huang et al. (2013) believed that NLE were positively correlated with SA. According to the Main Effect Model (Tiegs, 2010), social support could buffer the negative impact of NLE on the physical and psychological aspects, and then made the individual's physical and psychological development move toward a healthy direction. Social avoidance, as a kind of negative psychology and behavior, could promote the physical and mental development of individuals toward health under the role of social support (Song et al., 2020). For college students under psychological and physical development at that time, if individuals felt effective social support, it was helpful to alleviate their Internet addiction behaviors (Tu, 2016). Studies had shown that social support (Wang et al., 2021) and SA (Ye et al., 2017) were important factors affecting CPA. And social support played a crucial role in SA. Therefore, it could be inferred

that social support could affect the SA of individuals in the face of NLE, and further affect the CPA behavior of individuals. Many studies had shown that mindfulness not only played an important role in regulating the physical and mental health of individuals, but also that mindfulness training was beneficial to the improvement of individual negative emotions and behaviors. For example, mindfulness traits could modulate an individual's self - esteem (Xv, 2022), anger (Xu et al., 2017), social avoidance (Xiong, 2016), perceived social support (Li et al., 2020; Hu et al., 2025) and other aspects. At the same time, mindfulness intervention could have certain positive effects on insomnia (Tao et al., 2017), negative emotions (Yu et al., 2019) and CPA (Zhang and Zhu, 2014). In addition, studies had also shown (Peng et al., 2023) that a high level of mindfulness might cause an individual to pay more attention to the use of various mobile phone software and be immersed in the present state. Such unconscious attention preference and attention detachment difficulties would lead to serious mobile phone addiction, which would further lead to college students' dependence on mobile phones.

To sum up, although mobile phones made our daily life more convenient, the inappropriate use of mobile phones also brought great troubles to the physical, psychological and social life of college students. Therefore, it had become a meaningful work to find ways and measures to alleviate CPA. By combing the previous literature, it was found that the formation mechanism of CPA was relatively complex, and NLE were one of the inducing factors. Current studies had explored the relationship between NLE and CPA. However, most of the studies were conducted on the direct relationship between the two. Or studied the individual mediating variables between NLE and CPA. The simple mediation model was not enough to explain the complex mechanism between the two. In order to further explore the mechanism of NLE on CPA, we needed to include more variables for research. From the

perspective of the psychological stress system model, NLE were the stressors in this model, and CPA was the stress response. There might be some mediating factors between NLE and CPA. Mindfulness, PSS and SA were found to be important factors for CPA. Previous studies had shown that individuals facing NLE would have SA in the social process, which further led to CPA behavior. Mindfulness, PSS and SA were important factors affecting CPA. PSS played a crucial role in SA, while mindfulness held an important position in both PSS and SA. Past studies had investigated the relationship between NLE, mindfulness, PSS, SA, and CPA. From the perspective of theoretical gap, there was no corresponding theoretical mechanism between these five variables. From a methodological point of view, researchers needed to increase the sample size between these five variables in this study. In order to explore the relationship between the five variables in more depth, it was necessary to incorporate these five variables into a model framework for research. Based on the psychological stress system model, under the effect of NLE, could NLE play a role in an individual's CPA through ML, PSS and SA?

Therefore, this study took college students as the research object, with NLE as the independent variable, CPA as the dependent variable, and ML, PSS and SA as the mediating variables, and tried to build a mediation model among the five variables of NLE, ML, PSS, SA and CPA. In order to find out the ways to ease college students' CPA and provide more possible solutions and suggestions for the improvement of the situation of college students' CPA.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of this study is to investigate the relationship between NLE and CPA, PSS, SA and ML as mediators among College Students.

1.4.2 Specific Objectives

- i. To determine the relationship between NLE and CPA among college students.
- ii. To determine the relationship between NLE and ML among college students.
- iii. To determine the relationship between NLE and PSS among college students
- iv. To determine the relationship between NLE and SA among college students.
- v. To determine the relationship between ML and CPA among college students.
- vi. To determine the relationship between PSS and CPA among college students.
- vii. To determine the relationship between SA and CPA among college students.
- viii. To determine the ML as mediator for NLE on CPA among college students.
- ix. To determine the PSS as mediator for NLE on CPA among college students.
- x. To determine the SA as mediator for NLE on CPA among college students.

1.5 Research Questions

- a) Was the NLE related to CPA among college students?
- b) Was the NLE related to ML among college students?
- c) Was the NLE related to PSS among college students?
- d) Was the NLE related to SA among college students?
- e) Was the ML related to CPA among college students?
- f) Was the PSS related to CPA among college students?
- g) Was the SA related to CPA among college students?
- h) Was the ML as mediator for NLE on CPA among college students?
- i) Was the PSS as mediator for NLE on CPA among college students?
- j) Was the SA as mediator for NLE on CPA among college students?

1.6 Research Hypotheses

The null hypotheses of this study were:

Ho1: NLE was not significance related to CPA among college students.

Ho2: NLE was not significance related to ML among college students.

Ho3: NLE was not significance related to PSS among college students.

Ho4: NLE was not significance related to SA among college students.

Ho5: ML was not significance related to CPA among college students.

Ho6: PSS was not significance related to CPA among college students.

Ho7: SA was not significance related to CPA among college students.

Ho8: ML was not mediate of NLE on CPA among college students.

Ho9: PSS was not mediate of NLE on CPA among college students.

Ho10: SA was not mediate of NLE on CPA among college students.

1.7 Conceptual and Operational Definition

1.7.1 Cell Phone Addiction

Conceptual Definition

Cell phone addiction (Yen et al., 2009; Liu et al., 2025), also known as “mobile phone addiction”, “mobile phone addiction tendency”, “problematic mobile phone use”, etc., referred to excessive addiction to various activities in mobile phone due to the lack of individual control over the use of mobile phone through the medium of mobile phone. Walsh et al. (2007) defined CPA from withdrawal, salient behavior, and uncontrollable or compulsive behavior three aspects. According to Bianchi and Phillips (2005), problematic mobile phone use not only referred to the dependence of individuals on mobile phones in daily life, but also increased the frequency of mobile phone use in certain occasions, such as texting while driving, frequent use of mobile phones in movie theaters or listening to reports. Chinese scholar Shi (2009) defined CPA as an individual's compulsive dependence on mobile phones in the process of using mobile phones, which might lead to individual impairment of various functions. Xu et al. (2008) defined CPA as an individual's excessive dependence on mobile phones and resulting in addictive behaviors, which were defined from four aspects: behavioral tolerance, behavioral withdrawal, social function and physiological response.

Operational Definition

In this study, this study defined CPA as a situation where college students, in daily life, in order to meet their own specific requirements or escape feelings of discomfort, and through the medium of mobile phones, relieved the uncomfortable feelings in daily life,

further became so reliant on mobile phones that they couldn't extricate themselves, and produced problems in aspects such as psychology, behavior, and social adaptation. In this study, CPA was evaluated in four aspects of highlighting behavior, withdrawal symptoms, social comfort, and mood change by using the Mobile Phone Addiction Tendency Scale (Xiong et al., 2012) for college students. The scale consisted of 16 questions and 4 dimensions. The four dimensions of the scale were highlighting behavior, withdrawal symptoms, social comfort, and mood change. The Cronbach α coefficient of the scale was 0.83, and the internal consistency α coefficient of each component ranged from 0.55 to 0.80. The reliability and validity of the scale were good.

1.7.2 Negative Life Events

Conceptual Definition

The concept of NLE (Hobfoll, 1989) originally referred to the stress generated by individuals, that is, the sum of energy and physical strength needed by individuals to restore their original adaptive state when they encountered various stimulating events that made their life out of balance. Scholar Liu (1997) defined NLE as the sum of various internal and external stimuli encountered by individuals in interpersonal relationships, study pressure and other aspects from the perspective of adolescents. Ye et al. (2014) defined NLE from the perspectives of cognition, behavior and emotion, which referred to all the events that an individual had been exposed to or experienced that could generate negative stimuli to the individual's cognition, behavior and emotion.

Operational Definition

In this study, the Adolescent Self - Rating Life Events Checklist (ASLEC) developed by Liu et al. (1997) was used to evaluate six aspects: interpersonal bond, study tension,

college entrance pressure, sanction, the deprivation of relatives, friends and assets, and health acclimation. Since the research object of this study was the students on the university campus, this study defined NLE as the threatening stimulus events that individuals could be aware of in the daily life process. These threatening stimulus events could further change students' existing habits and behavior patterns, and have a negative influence on college students' cognition, emotion, and behavior abilities. The scale included 27 negative life events and 6 dimensions. The scale had good reliability and validity and had been widely used by Chinese scholars to evaluate the NLE of Chinese students and college students.

1.7.3 Social Avoidance

Conceptual Definition

Social avoidance (Watson and Friend, 1970) was originally proposed by Watson and Friend in 1969. This concept referred to an unhealthy external behavior and internal psychology of avoiding communication and fear of rejection due to individuals' excessive attention to others' evaluation of their words and behaviors in social communication, or physical and psychological discomfort in the process of communication. Watson and Friend believed that social interaction mainly included two factors: SA psychology and fear of negative evaluation. Later, the definition of SA (Watson and Friend, 1970) was defined as a series of psychological behaviors of individuals avoiding social interaction in the process of communication. Chinese scholar Guo (2000) believed that SA occurred because individuals had strong feelings of worry, unease or fear about the situation, which led to SA behavior.

Operational Definition

In this study, SA was defined as a situation where an individual, in the process of social interaction, due to the individual paying too much attention to others' evaluation of their own words and behaviors, had an uncomfortable physical and psychological feeling in the process of communication. This might further lead to the individual being unable to communicate with others or having a reduced desire to interact with others, presenting SA behavior or tendencies. This study used one of the SA and distress scales developed by Watson and Friend (1970), namely the SA Scale. In this study, the SA scale was used to measure the SA status of college students.

1.7.4 Perceived Social Support

Conceptual Definition

In 1988, Zimet et al. (1991) separated PSS from social support research and defined PSS from three perspectives: friend support, family support and other support. They also believed that PSS referred to the subjective understanding and feelings of individuals in relation to their friends, family and other aspects. Lakey et al. confirmed that PSS was a cognitive concept with high stability and long persistence, and the evaluation of this cognitive concept could effectively perceive the degree of an individual's own social support (Mankowski and Wyer, 1996). Samson et al. (1991) defined the concept of PSS from the experience of whether an individual was understood and respected by others, and whether he was emotionally supported by others. Chinese scholar Xiao (1994) defined social support from three aspects: subjective social support, actual social support and utilization of social support.

Operational Definition

This study gave a definition of PSS as the support that an individual could perceive from others in the form of emotion, respect, understanding, such as moral support. This kind of support might be real, might also be potential or even false, but the individual could subjectively feel it. In a word, PSS (Butensky et al., 2025) was the sum of subjective support that an individual felt from different aspects of the social support system. This study used the PSS scale developed by Zimet et al. (1988) to measure the PSS level of college students from three aspects: family support, friend support and other support. This study used the PSS scale revised by Chinese scholars Yan Biaobin and Zheng Xue to measure the PSS level of college students from three aspects: family support, friend support and other support. The scale consisted of 12 questions and 3 dimensions. The three dimensions in the scale were friend support, family support and other support.

1.7.5 Mindfulness

Conceptual Definition

Brantley and Kabat - Zinn (2007) saw mindfulness as a kind and non - critical awareness of the present that could help us free ourselves from anxiety and panic. Scholars Bishop et al. (2004) regarded mindfulness as a state trait, emphasizing that mindfulness was an individual's self - control over the current emotion, thinking, attention and behavior, and an experiential - oriented acceptance of the present experience with openness, curiosity and acceptance. In addition, some scholars (Davidson, 2010) regarded mindfulness as a mental state and mental trait, which could be used to regulate anxiety and other negative emotions. Kabat - Zinn (2010) believed that mindfulness was a kind of awareness emerging from purposeful and non - judgmental focus on the present moment, that is, individuals paid attention to the current internal and external experience, behavior or thoughts, etc., and did

not judge the current feeling, emphasizing attention to the present moment. At that time, Kabat – Zinn’s definition of mindfulness was more widely used.

Operational Definition

In this study, researchers defined mindfulness as an individual’s awareness and acceptance of everything experienced at the moment with a beginner’s curiosity, non - judgment, acceptance and openness, and awareness of the feelings and changes brought by the things experienced at the moment. The researchers found that the the Mindful Attention Awareness Scale (MAAS) was more suitable for measuring the ML of Chinese college students, and its reliability and validity were good. Therefore, we finally decided to use the MAAS as a tool to measure the ML in this study. This scale was a single - dimension scale with 15 items. The Likert scale points ranged from 0 to 6, with “always” = 1 point, “often” = 2 points, “sometimes” = 3 points, “occasionally” = 4 points, “rarely” = 5 points, and “never” = 6 points.

1.8 Significance of the Study

The theoretical significance and practical significance were described as follows:

1.8.1 Theoretical Significance

If the hypothesis model in this study was confirmed, it had certain theoretical guidance value for reducing individual CPA.

Firstly, this study investigated the actual situation of college students’ NLE, mindfulness, PSS, SA and CPA by empirical investigation, so as to provide theoretical reference and guidance for college students to carry out mental health education.

Second, NLE could directly affect individual CPA, which indicated that many aspects of NLE, such as examination, interpersonal relationship, academic future, life adaptation, heterosexual interaction, self - actualization and support from relatives and friends, had important theoretical guiding significance for the use and control of individual CPA.

Finally, NLE could also indirectly predict individual CPA through mindfulness, PSS and SA. Based on previous literature, there were not enough studies on the role of mindfulness, PSS, and SA in the relationship between NLE and CPA. This study investigated the key role of mindfulness, PSS, and SA in the relationship between NLE and CPA, which enriched the theoretical research on NLE and CPA to a certain extent.

1.8.2 Practical Significance

Mobile phones were originally designed to facilitate life, work and study. However, with the rapid development of mobile phone functions and various software, the inappropriate use of mobile phones by college students brought adverse effects on their physical, psychological and social life. Many researchers had linked NLE with CPA behavior. It was generally believed that when individuals encountered NLE, they were more likely to feel uneasy and escape social interaction through the medium of mobile phone, which further led to the occurrence of CPA. At that time, the rate of CPA among college students was still relatively high, and it needed various efforts to reduce the CPA behavior of college students. Previous studies had shown that reducing individual CPA played a protective role in individual psychological, physical and social adaptation.

First of all, reducing individual CPA could not only alleviate adverse psychological and physical diseases, but also enable individuals to participate in college social activities, which was more conducive to the smooth transition from college campus to social work environment. Therefore, the research on CPA of college students was of great importance for college students to adapt to college life as soon as possible.

Second, if the hypothesis of this study was confirmed, it could provide multiple avenues for intervention of CPA among college students. In the future, researchers could intervene with mobile phone addiction in college students through levels of mindfulness and SA and social support. Therefore, this study could provide some theoretical basis and guidance for future researchers to study the intervention measures of college students' mobile phone addiction.

1.9 Chapter Summary

This chapter comprehensively covered the problem statement, objectives of the study, research questions, research hypotheses, basic overview about CPA, and significance of this research. This study aimed to investigate the relationship among college students' NLE, ML, PSS, SA and CPA. The outcomes of the result were beneficial to the study of college students' CPA. This chapter also highlighted the role of ML, PSS, and SA in the relationship between NLE and CPA, which enriched the theoretical research on NLE and CPA to a certain extent.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

In this chapter, by reviewing the domestic and foreign literature, the researcher mainly described the sources, common theories and the relationships among NLE, mindfulness, PSS, SA and CPA. A review of related works of literature, theories and models, and the theoretical and conceptual framework were discussed.

2.2 Phone Addiction

Addiction, also called dependence (Yen et al., 2009; Yang et al., 2025), referred to a state in which an individual was dependent on others or things and could not be independent or self-sufficient. Dependence could be divided into psychological dependence and behavioral dependence. Excessive dependence on others in psychology and behavior made individuals lose the ability to live independently, unable to adapt to social life, and then led to individual personality defects. As the name implies, CPA referred to the inability of individuals to adapt to social life by relying on the medium of mobile phone, which in turn led to a series of psychological and behavioral problems. Scholars from different research fields had different definitions and names for CPA. Some scholars (Toda et al., 2008; Yen et al., 2009) believed that CPA referred to using the mobile phone as the medium, where the individual did not control the use of the mobile phone, which made the individual excessively addicted to various activities on the mobile phone, and made the individual further develop a strong and continuous sense of craving and dependence on the mobile phone. It also led to obvious social and psychological impairment of individuals in their daily life, such as study, work and social interaction. Walsh et al. (2007) defined CPA from

withdrawal, salient behavior, and uncontrollable or compulsive behavior three aspects. According to Bianchi and Phillips (2005), problematic mobile phone use not only referred to the dependence of individuals on mobile phones in daily life, but also increased the frequency of mobile phone use in certain occasions, such as texting while driving, frequent use of mobile phones in movie theaters or listening to reports. Chinese scholar Shi (2009) defined CPA as an individual's compulsive dependence on mobile phones in the process of using mobile phones, which might lead to individual impairment of various functions. Xu et al. (2008) defined CPA as an individual's excessive dependence on mobile phones and resulting in addictive behaviors, which were defined from four aspects: behavioral tolerance, behavioral withdrawal, social function and physiological response. Xing (2020) believed that CPA referred to the uncontrollable behavior of individuals using mobile phones to meet their specific needs, which led to a series of psychological, behavioral and social adaptation problems.

It could be said that the mobile phone was a double-edged sword, which brought convenience to people, but also brought a series of side effects. Chinese scholar Fan and Su (2020) conducted a survey on 5403 college students and the results showed that, from the perspective of time, 74.9% of college students had used mobile phones for more than 4 years, and 93.2% of them used mobile phones for more than 3 hours every day. In terms of mobile phone expenses, 49.3% of college students spent 50 to 100 yuan per month on mobile phones. In terms of the purpose of using mobile phones, 54.8% of college students used mobile phones for texting, calling and using WeChat. If individuals did not control the use of mobile phones, it would bring psychological, physical and social damage to them. In terms of individual physiology, long-term use of mobile phones kept individuals in one position for a long time, which further led to a series of physical problems, such as spinal curvature,

head pain, neck pain, shoulder pain and back pain, insomnia, hearing disorder and vision problems (Jenaro et al., 2007). From the social aspect, college students avoided the study tasks due to their CPA or reduced the efficiency of completing the tasks, resulting in partial loss of social function (Leung et al., 2007). In addition, excessive use of mobile phones could also lead to a series of psychological problems, such as depression (Bickham et al., 2015) and anxiety (Jenaro et al., 2007).

In summary, CPA was also called mobile phone addiction (Choliz, 2010), mobile phone addiction tendency, problematic mobile phone use (Bianchi and Phillips, 2005). So far, there had been no unified standard for the concept of CPA. In this study, this study defined CPA as a situation where college students, in daily life, in order to meet their own specific requirements, or to escape feelings of discomfort, and through the medium of mobile phones, relieved the uncomfortable feelings in daily life, further became so reliant on mobile phones that they couldn't extricate themselves, and produced problems in aspects such as psychology, behavior and social adaptation.

2.2.1 Cell Phone Addiction Related Theories

At that time, there were many theories related to CPA. The main theories included Compensatory Internet Use Theory, The Interaction of Person - Affect - Cognitive - Execution model for Internet addiction, Problematic Mobile Phone Usage Path Model, Media Dependency Theory, Uses and Gratification Theory, etc.

(a) Compensatory Internet Use Theory

According to the compensatory use theory (Liu et al., 2016), when individuals were in a negative state when facing adverse events, they usually used the network to escape the

current reality and alleviate their physical and mental discomfort, so as to realize their unmet needs in real life, thus increasing the use of network equipment. On the basis of this theory, individuals escaped the predicament in reality by constantly using mobile phones, so as to reduce their physical and mental discomfort, which further led to the problem of mobile phone addiction. However, when the constant use of mobile phones failed to alleviate the physical and mental discomfort, the individual would be further trapped in the problem of mobile phone use, forming a vicious circle. The deficiency of the compensation theory of Internet use was that it paid more attention to the main effect of real environmental factors on CPA, and ignored the important influence of individual factors on CPA.

(b) The Interaction of Person-Affect-Cognitive-Execution model for Internet addiction (I-PACE)

The interaction of person - affect - cognitive - executive model of internet addiction (Brand et al., 2019; Liu et al., 2025) believed that individual physiological factors, personality traits, emotion, cognition and executive function could significantly predict the problem of Internet addiction, and the interaction between these factors could also significantly predict the problem of phone dependence. Compared with the compensatory internet use theory, this model emphasized the influence of individual factors on CPA. However, the disadvantage of this model was that it neglected the influence of environmental factors on individual Internet addiction. In addition, the division of individual factors in this model also had some problems. This model divided individual factors into P (Person), A (Affect), C (Cognition) and E (Execution). Although this classification method had its relative systematic thinking, it obviously lacked theoretical basis from the perspective of psychology. Some variables involved in this classification could be divided into different

categories at the same time. This classification method made researchers confused about the concepts in the model, and it was difficult to apply in practice.

(c) Problematic Mobile Phone Usage Path Model

The Problematic Mobile Phone Usage Path Model (Billieux, 2012) suggested that individuals might have four paths when they overused mobile phones, namely, the impulsive path, the relationship maintenance path, the personality extroversion path and the indirect Internet addiction path. Through these four paths, individuals would have negative effects and further fall into a vicious cycle. The first path was the impulsive path, which meant that individuals with poor self - control and / or poor emotional regulation would fall into a vicious cycle when using mobile phones. The second path was the relationship maintenance path, which referred to the excessive use of mobile phones by individuals in order to maintain the stability and intimacy between them and their partners, family members and friends, and to gain comfort from such relationships. The third path was the personality extroversion path, which referred to those individuals who were sociable, cheerful and had a strong desire to communicate. They were highly eager to communicate with friends in order to establish a potential or existing circle of friends and overused mobile phones. Compared with other paths, the third path had slightly less negative impact on individuals, which might lead to the problem of excessive mobile phone charges. The fourth path was the indirect effect on Internet addiction path. Due to the fact that smart phones had a variety of applications and wireless mobile networks, which could realize online multiplayer online games, the problem of this kind of mobile phone use was that the individual was not addicted to mobile phone communication itself, but addicted to online games on the mobile phone, thus having a large

- scale mobile entertainment experience. Eventually, it could lead to an individual's mobile phone addiction problem.

(d) Media Dependency Theory

This theory (Ball - Rokeach & Defleur, 1976) was put forward by scholars such as Deffler and Boroch in 1976. In media dependence theory, Deffleur and Boroch believed that individuals, mass media and social institutions had a certain combination of relations. According to this theory, with the development of electronic equipment quality and technology, individuals showed a strong sense of dependence on new media. Mass media was particularly important to individuals if they had to rely on it to fulfill certain needs and purposes. An individual's dependence on mass media produced an interactive but unequal relationship. Especially in the context of mutual integration of mass media, compared with computers, mobile phones were more intelligent, more popular and more convenient to carry, and their advantages took the lead in new media, which further led to more frequent use of mobile phones by individuals and made it easier for individuals to become dependent on mobile phones.

(e) Uses and Gratification Theory

This theory (Katz et al., 1973; Morris and Ogan, 1996) was proposed by Grivitch and Hess in 1973. This theory emphasized that individuals actively used media to meet some needs and desires of individuals, and some needs and desires of individuals would further restrict the use and dissemination of media. According to the theory, individuals used the Internet to meet their five needs, namely, cognition, emotional expression, personal integration, social integration and pressure release. This theory could be summarized as the

process of “social factor - psychological factor - media expectation - media contact - demand satisfaction”.

(f) Behaviorist Reinforcement Theory

This theory (Wang, 2015) was proposed by Skinner, a representative figure of new behaviorism in the United States. It emphasized that people or animals would take certain actions to act on the environment in order to achieve a certain goal. When the consequences of such actions were beneficial to individuals, such actions would be repeated; on the contrary, the actions would be weakened or disappear. In the process of using mobile phones, individual needs could be satisfied and psychological pleasure could be generated. For some individuals with social difficulties, in order to escape the frustration they might face or bring, they would obtain psychological comfort through the medium of mobile phone, which further promoted the frequency and time of using mobile phone and then led to the appearance of mobile phone addiction behavior.

To sum up, the theories of mobile phone addiction were mainly elaborated from the perspectives of physiological factors, psychological factors, social factors and so on. It was not comprehensive to understand smartphone addiction only from a single perspective. Therefore, this study mainly explored the impact of NLE on CPA from the social, psychological and physiological perspectives, based on the network use compensation theory, problematic mobile phone use model, use and satisfaction theory, and behaviorist reinforcement theory. When individuals encountered NLE and were in a negative situation, in order to escape the present reality and reduce physical and mental discomfort, individual SA might arise in the process of social interaction. They would use mobile phones and network equipment for psychological comfort, thus increasing the use of network equipment

and further causing individual mobile phone addiction behavior. In this process, if researchers provided targeted guidance on college students' level of mindfulness, SA and PSS, it might further alleviate the influence of NLE on college students' CPA behavior.

2.2.2 Interventions for Cell Phone Addiction

Through literature review, researchers found that compared with China, foreign research investment in mobile phone intervention was relatively small, which might be related to the large number of Chinese youth Internet users. The earliest research was to regulate and intervene in youth viewing through parents. In the late 20th century, the intervention on children's viewing behavior turned to the intervention on Internet use. Kirsh and Steven (2012) classified parental intervention as joint intervention (i.e., parents accompanied and supervised adolescents when they used the Internet) and restrictive intervention (Kirwil, 2009) (which limited and supervised the time and content when teenagers used the Internet) and active intervention (Lee and Chae, 2007) (compared with joint intervention and restrictive intervention, active intervention tended to improve adolescents' correct cognition of Internet use and form correct emotional values on Internet media), so as to reduce the harm of the Internet on adolescents' physical and mental health and academic performance.

At that time, there were three main categories of Chinese scholars' interventions aimed at students' CPA. The first category was cognition - based interventions. These included inhibitory control training (Ding et al., 2018), mindfulness - based cognitive therapy (Zhang and Zhu, 2014), group psychological training (Zhang et al., 2016), short - term focus resolution therapy (Xu et al., 2017), peer group psychological counseling (An et al., 2020) and other emotional and attentional bias training. The second category was the

exercise intervention proposed by Kim (2013), which mainly included exercise intervention (Ge et al., 2015), physical exercise (Bu, 2014) and so on. The third category was based on the environmental intervention method mainly proposed by Shi (2009), which properly controlled the CPA of adolescents from the aspects of family, school and individual, so as to achieve the purpose of reducing CPA. Although the above methods had achieved certain effects in the control of students' CPA, the existing studies on CPA in China were mostly empirical studies on intervention, and few discussed the mechanism between NLE and CPA. It was particularly important to consider whether the effect of NLE on CPA was influenced by other mediating factors

2.3 Negative Life Events

For an overview of life events, different fields of study offered different definitions. As early as the 1930s, psychologists in the field of psychology had studied life events, defining them as a variety of problems encountered by individuals in daily life, which might lead to corresponding psychological and physiological reactions. Here, the stimulus sources that could lead to the individual's psychological and physiological reactions were called stressors. Psychologists believed that all changes in daily life were potential stressors, but not all stressors could lead to individual psychological and physiological reactions. Only those harmful events or events or changes that individuals could not cope with could be called effective stressors. In recent years, some scholars had summarized life events (Liu et al., 2021) as a psychosocial stressor, which referred to the sum of various stimuli encountered by individuals in daily life, which might further lead to individual psychological imbalance and damage physical health life situations and events. Among them, the stimulus sources (Tang and Zhou, 2014) included the individual's family situation, work, social status, living environment, cultural tradition, economic conditions, etc. When the individual

encountered these stimuli, the individual's life style and behavior style might develop in a certain direction. According to some scholars (Li, 2008), if an individual's life style and behavior developed in a positive direction and brought comfortable and pleasant feelings to the individual, it was called a positive life event. If the individual's life style and behavior developed in a negative direction and brought the individual a sense of tension and discomfort, it was called a negative life event. Different scholars had different views on the concept of NLE, and there was still no unified concept.

In foreign countries, the concept of NLE (Hobfoll, 1989) originally referred to the stress generated by individuals, that is, the sum of energy and physical strength needed by individuals to restore their original adaptive state when they encountered various stimulating events that made their life out of balance. Whether a stimulus event would cause pressure to an individual depended on the individual's perception of the stimulus event. In terms of life events, Lazarus (2000) believed that whether a life event posed pressure to an individual needed to be further determined through cognitive assessment. If a life event posed a threat or harm to an individual after cognitive assessment, then the life event would cause pressure to the individual. Selye's interpretation of life events was similar to Lazarus's. Selye (1976) believed that the most common life events of individuals were the stressors that affected and stimulated the individual's stress response, which further led to the individual's cognitive imbalance and different kinds of emotional experience, and might cause great harm to the individual's physical and mental health. Some foreign scholars also believed that (Holmes and Rahe, 1967) life events referred to those events that could cause individuals to change their existing life patterns and have great adverse effects on individuals within a certain period of time. Holmes and Rahe emphasized that what life events changed was the existing stable life state rather than the psychological meaning, emotion or social desire. On this

basis, Brown et al. (1973) also believed that life events would have an impact on the physical and mental health of individuals and lead to their physical and mental disorders. Linda et al. (2012) summarized NLE as those events that could cause cognitive discordancy and cause certain obstacles and burdens to all future behaviors of individuals. In summary, foreign researchers focused more on defining life events from the perspective of cognitive evaluation.

In China, scholar Liu (1997) defined NLE as the sum of various internal and external stimuli encountered by individuals in interpersonal relationships, learning stress and other aspects from the perspective of adolescents. Fan et al. (2011) believed that NLE originated from social and cultural systems such as interpersonal communication, learning pressure, punishment, loss, and health adaptation. Qu (2021) explored NLE from five aspects of distress: economy, learning, interpersonal relationship, love, punishment and failure. Liu (1997), Fan et al. (2011) and Qu (2021) all summarized NLE from the perspective of adolescents, and believed that the NLE encountered by adolescents had specific dimensions and were affected by interpersonal, learning, punishment and other problems. In addition, Chinese scholars had also explained NLE from other perspectives. For example, Ye et al. (2014) defined NLE from the perspectives of cognition, behavior and emotion, which referred to all the events that an individual had been exposed to or experienced that could generate negative stimuli to the individual's cognition, behavior and emotion. Li (2008) believed that life events could be defined from both positive and negative perspectives, among which events that could stimulate positive emotions and have a positive impact on individuals were referred to as positive life events, while events that could stimulate negative emotions and have a negative impact on individuals were referred to as NLE. To sum up,

Chinese scholars focused more on defining life events from the perspectives of interpersonal communication, learning pressure, punishment and so on.

As the research object of this study was university campus students, this study defined NLE as the threatening stimulus events that individuals could be aware of in the daily life process. These threatening stimulus events could further change students' existing habits and behavior patterns and have a negative influence on college students' cognitive, emotional and behavioral abilities.

2.3.1 Theories Related to Negative Life Events

There were two theories related to NLE. The main theories included Psychological stress system (multi - factor interaction) model and Cognitive evaluation model of stress.

(a) Psychological Stress System (Multi-Factor Interaction) Model

The model (Wu et al., 2001; Jiang, 2004; Yao et al., 2013) was proposed by Jiang in 2004. In 1987, Jiang made a series of explorations on the relationship between stress - related factors and health. In 1990, Jiang carried out a comprehensive evaluation study on stress and related factors. After 2000, Jiang began to conduct empirical research on the relationship between psychosocial stress factors. In 2004, Jiang proposed the psychological stress multi - factor system model. Jiang thought that psychological stress was the process from the stress source to the stress reaction involving various factors. The psychological stress was defined as a process in which an individual, under the influence of a stress source, through the mediating roles of cognitive appraisal, coping styles, social support, and personality traits among many factors, eventually led to psychological, physiological, and behavioral responses. This model mainly included life events (such as interpersonal relationships, etc.),

cognitive evaluation (such as automatic thinking, etc.), personality traits (such as ideas, temper, etc.), coping styles (positive and negative coping styles, etc.), internal and external social support, stress response (e.g., mental, physical, behavioral) and other relevant psychological, social, and biological factors. Jiang emphasized that stress was an adaptation process of individuals to environmental threats and challenges. The causes of stress were life events, and the results of stress were adaptive and maladaptive psychosomatic responses. The process from life events to stress response was restricted by a variety of internal and external factors, such as individual cognitive evaluation, social support, and coping style.

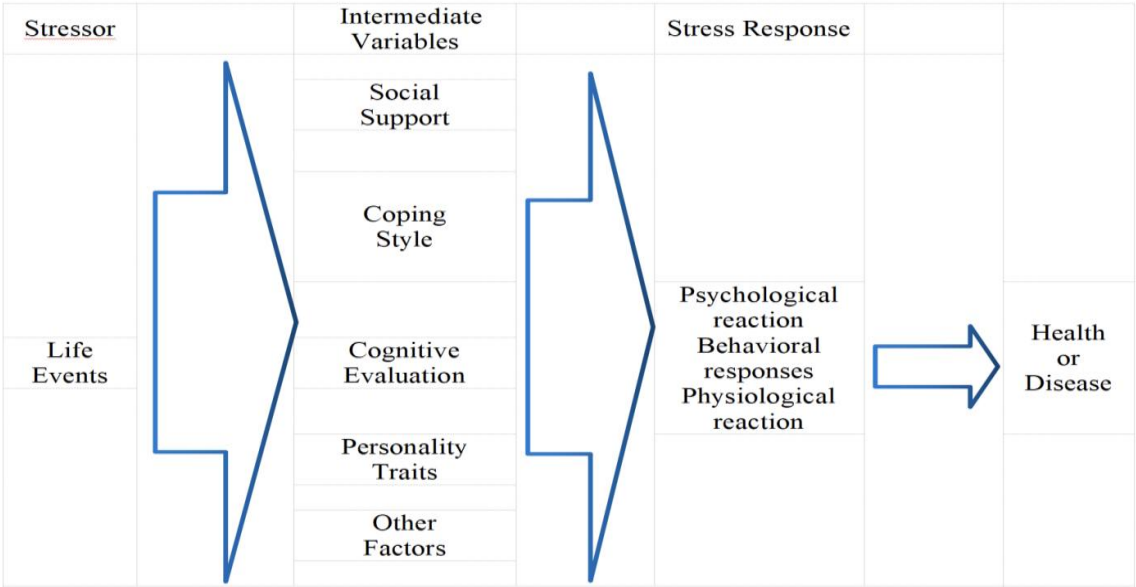


Figure 2.1: Physiological Stress System Model

(b) Cognitive Evaluation Model of Stress

According to this model (Yao et al., 2013), there were various stress events that caused stress response, but different individuals had different cognitive evaluations of stress events, and individuals would make positive and negative evaluations of stress events. In 1979, Woolfolk and Chardson formally put forward the cognitive evaluation model of

stress. It was believed that stress response was not the direct result of environmental factors, but related to an individual's feelings, opinions and evaluations of stressful events. In a word, this model believed that stress response was the result of the individual's cognitive evaluation of the situation or event. The occurrence and degree of stress response were determined by the way people felt and evaluated things and the meaning they gave to the stressor.

To sum up, according to the psychological stress system model, in this study NLE stress was a stressor. When individuals encountered NLE, they might adopt SA as a coping style in the social process, and they avoided social interaction through the medium of mobile phone, which further led to the outcome of CPA. When individuals encountered NLE, after receiving external social support, they might reduce SA behavior in the process of social interaction, and the degree of CPA might be alleviated or disappear. At the same time, studies (Qiu et al., 2020) had shown that individual ML could regulate CPA behavior. Also, studies had shown (Peng et al., 2023) that a high level of mindfulness might cause an individual to pay more attention to the use of various mobile phone software and would lead to serious mobile phone addiction, which would further lead to college students' dependence on mobile phones. In this study, combining the concepts of mindfulness, PSS, and SA, mindfulness was a cognitive style, PSS was the social support in the model, and SA was a coping style. According to the psychological stress system (multi - factor interaction) model, cognitive evaluation, coping style and social support were the mediating (inter - mediating) factors of this system. In this study, this stress process was moderated by mindfulness, PSS and SA. The stress response in this study mainly included mental, physical, and behavioral aspects, and college students' CPA also included psychological, physical, and behavioral aspects. Starting from the stress response in this model, this study took NLE as a stressor and college

students' CPA as a stress response. To explore the relationship among NLE, ML, PSS, SA and CPA.

2.4 Social Avoidance

Social interaction referred to the use of certain ways for people to communicate with each other under certain psychological activities in social activities to achieve the purpose of exchanging information and communicating emotions. It was one of the important activities of human society and played a crucial role in personal and economic and social development. From the individual psychological level, social interaction could meet the psychological needs of individuals and could help individuals increase emotional communication. From the perspective of individual society, social communication could increase individual knowledge and social experience, which was conducive to individual self-improvement. In a word, normal social communication and good interpersonal relations were important prerequisites for the advancement of individual psychic health. For undergraduates, good social communication was conducive to the sound development of college students' personality and the smooth completion of socialization. However, in the rapid social development at that time, more and more students were in the important stage of rapid physical and psychological growth and gradual mental maturity, which made a part of college students encounter a series of social problems in the process of social communication. In order to avoid the physical and psychological discomfort caused by social interaction, some college students felt distressed in the process of social interaction and even appeared SA phenomenon.

Social avoidance (Watson and Friend, 1970) was originally proposed by Watson and Friend in 1969. This concept referred to an unhealthy external behavior and internal psychology of avoiding communication and fearing rejection due to individuals' excessive attention to others' evaluation of their words and behaviors in social communication, or physical and psychological discomfort in the process of communication. Watson and Friend believed that social interaction mainly included two factors: SA psychology and fear of negative evaluation. Later, the definition of SA (Watson and Friend, 1970) was defined as a series of psychological behaviors of individuals avoiding social interaction in the process of communication. Watson & Friend thought that SA mainly included three aspects. The first was the negative self - assessment of cognitive. For example, my ability was inferior to others and I wasn't good - looking. The second was the behavior of defensive withdrawal. For example, in social interaction, try to avoid participating in social activities that had communication with people. The third was the nervous mood, such as worrying about being denied by others, repeated toileting, flushing, sweaty palms and so on.

In the 1990s, a term "social anxiety disorder" was mentioned in the Journal of Clinical Psychiatry, which believed that (Li & Ma, 2004) social anxiety disorder referred to the clumsiness or humiliation of individuals in the process of social interaction due to the fear that some of their speech acts would be noticed by others. At the same time, it might be accompanied by blushing, trembling, worrying, vomiting or the urgent need to relieve oneself, which might lead to the strong anxiety of individuals or the feeling of trying to avoid social situations. According to Chinese scholar Zhang (1992), SA referred to the feeling of internal insecurity caused by people's inability to meet predetermined goals in their social roles and behaviors during the transition from biological human beings to social human beings. And this anxiety might lead to SA. Chinese scholar Guo (2000) believed that SA

occurred because individuals had strong feelings of worry, unease or fear about the situation, which led to SA behavior.

To sum up, different scholars had different explanations for SA, but almost all of them defined SA from two aspects: emotional and behavioral responses. In this study, SA was defined as an individual in the process of social interaction. Because the individual paid too much attention to others' evaluation of their own words and behaviors, an uncomfortable feeling in the process of communication or physical and psychological discomfort of the individual appeared, which might further lead to the individual's inability to communicate with others or a reduced desire to interact with others, SA behavior or tendencies

2.4.1 Social Avoidance Related Theories

There were a few theories related to SA, such as Psychoanalytic Theory (Huang et al., 2013; Yi, 2020). There was Dominant Perspective Theory as follows:

The dominant perspective theory (Wang et al., 2021) held that individuals had their own unique advantages. The theory emphasized that individuals, groups, families, and communities all had their own strengths. While trauma, abuse, illness and struggle could be hurtful, they could also be challenges and opportunities. This theory held that all environments around an individual were full of resources and opportunities. The dominant perspective theory was that when an individual faced difficulties, on the surface it was a kind of hurt and misfortune for the individual, but on the other hand it might be an opportunity and challenge. Social workers should have focused more on the individual's personal advantages and all the resources nearby, encouraged individuals to accept the challenge and seize the opportunities, helped individuals restore an optimistic attitude towards life, and promoted the healthy growth of the individual. So far, although the empirical research of the

dominant perspective theory was obviously more than the theoretical research, the quantity was still far from enough, and the scientific nature of the research still needed to be improved. In terms of a single field, the empirical research of the dominance perspective theory still needed to be further strengthened.

To sum up, the theories of SA were mainly introduced from the perspective of an individual's treatment of difficulties and whether he or she had received positive attention from others. It was not comprehensive to understand SA only from a single perspective. Based on the dominance perspective theory, when an individual encountered a negative life event, if he regarded the negative life event as a difficult or insurmountable gap and did not get the positive attention and social support from others, then the individual would have SA. If individuals regarded NLE as challenges or opportunities and bravely faced NLE when encountering NLE, then individuals would not have SA or their SA behaviors would be alleviated.

2.5 Perceived Social Support

There were many studies on social support in academic circles. The definition of social support by scholars was mainly divided into two categories: one was the objective and practical support. For example, others directly provided material help to individuals, which was called actual social support. The other type referred to the subjective support of individuals, such as the spiritual support from others experienced or felt by individuals in the process of social communication, which was called subjective social support. And this kind of experienced support was called PSS.

A review of the literature showed that most studies on social support had been conducted since the 1960s. In the early 1970s, the concept of social support was introduced into the psychiatric literature (Yang, 2006). In the late 20th century, scholars focused their research on the concept of social support, by which time subjective and objective social support had emerged. In the early 21st century, scholars shifted their research focus to the relationship between social support and physical and mental health, and conducted a large number of practical studies.

Different scholars had different views on the concept of social support. In 1974, Caplan (1974) proposed social support for the first time, and Caplan (1974) believed that social support was a kind of continuous social collection. And this kind of social collection could provide individuals with the opportunity to know themselves, and enable individuals to maintain their expectations of others. When an individual needed support from others, such a set could provide emotional support, cognitive guidance and practical help to the individual. Later, Cobb (1976) subdivided the concept of social support, believing that social support could include emotional support and self - esteem support, which were the respect and understanding that individuals could feel in the process of social interaction, and these understanding and respect could effectively alleviate the negative impact of individual NLE. In 1988, Zimet et al. (1991) separated PSS from social support research and defined PSS from three perspectives: friend support, family support and other support. They also believed that PSS referred to the subjective understanding and feelings of individuals in relation to their friends, family and other aspects. Lakey et al. confirmed that PSS was a cognitive concept with high stability and long persistence, and the evaluation of this cognitive concept could effectively perceive the degree of individual's own social support (Mankowski and Wyer, 1996). Samson et al. (1991) defined the concept of PSS from the experience of

whether an individual was understood and respected by others, and whether he was emotionally supported by others. Chinese scholar Xiao (1994) defined social support from three aspects: subjective social support, actual social support and utilization of social support. Chinese scholar Li and Jiang (1996) believed that social support could come from family support, friend support and other support, and combined friend support and other support into extra - family support.

To sum up, this study gave a definition of PSS as the emotional, respectful, understanding, and moral support that an individual could perceive from the outside world. This kind of support might be real, might also be potential or even false, but the individual could subjectively feel it. In a word, PSS was the sum of subjective support that an individual felt from different aspects of the social support system.

2.5.1 Perceived Social Support Related Theories

So far, there had been many theories related to PSS, but the most commonly used theories were The main - effect Model, The Buffering Model, The Dynamic Model and Social Bonding Theory. An introduction to the relevant theories was given below.

(a) The Main-effect Model

According to this model (Tiegs, 2010), social support played a universal role in enhancing the physical and mental health of individuals, not only in the presence of stressors, but also in daily life. According to this model, there were two main ways to establish the relationship between social support and physical and mental health. The first way was that the emotional support function of social support could regulate individual endocrine, enhance systemic immunity and make individuals have a good health state. The second way

was that social support could effectively help individuals to change their bad life and behavior styles, help individuals to establish a positive attitude toward life, and make individuals willing to seek external help when they encountered difficulties, so as to maintain physical and psychological health. The theory also believed that no matter how much pressure an individual was under, as long as he or she got social support, no matter how much, it would play a certain role in the individual.

(b) The Buffering Model

According to this model (Tiegs, 2010), social support could play a buffering role through an individual's cognitive system. In other words, social support could reduce the negative impact of stressors on individuals by changing their evaluation of the stressors they encountered, so as to help individuals cope with stressful events correctly. In addition, social support could also buffer the negative effects of stressors on the physical and psychological aspects, so as to make the individual's physical and psychological development move toward a healthy direction. The model also suggested that the buffering effect of social support might be general or specific. The model also emphasized that social support played a buffering role only when individual stressors were associated with physical and mental health. In the absence of obvious stressors, social support had little effect on individuals. It was only when individuals encountered stressors that social support became effective.

(c) The Dynamic Model

According to this model (Qianjin, 2012), social support and stress or stressors should be taken as independent variables to play a role in physical and mental health through direct or indirect effects. The relationship between stress or stressors and social support was

interactive and influenced each other, and this relationship would change with the change of time.

(d) Social Bonding Theory

Social bonding theory (Hirschi, 1969), also known as social control theory or social bonding theory, was put forward by Hirschi, a famous American criminologist, in 1969. The theory emphasized the connection between individuals and traditional society, that is, social connection. Social connection was the core of the theory. This social connection was often manifested through the connection between the individual and parents, peers, family, school, work unit or social institutions with which the individual was closely related. This theory mainly included four aspects: attachment, participation, commitment and belief. The theory held that if an individual had a certain extent of emotional attachment to parents, peers, family, school, work units, or institutions closely related to the individual, would invest in social activities related to their parents, peers, family, school, work units, or social institutions, and not only had a firm goal of life, but also desired to be recognized by parents, peers, family, school, work unit or social institutions closely related to the individual, thus promoting the individual to further comply with social order and moral norms, then the individual was less likely to have deviant behavior or other problematic behaviors. In summary, the close connection between an individual and the social support system such as parents, peers, family, school, work unit or social institutions closely related to the individual helped to reduce the likelihood of an individual engaging in crime and related behavior problems. However, if the bond was low or damaged, it would increase the individual's delinquency or delinquent behavior.

To sum up, according to the Main - effect Model, The Buffering Model, The Dynamic Model and Social Bonding Theory, when individuals had the stress of NLE, the social support provided to individuals could strengthen individual positive affection, reduce individual bad mood, change the individual's cognition and evaluation of NLE, and help the individual build a positive attitude to life. It encouraged individuals to actively seek external help when encountering difficulties, instead of avoiding social interaction, so as to reduce their dependence on mobile phones and maintain their physical and psychological health.

2.6 Mindfulness

Derived from Eastern Buddhism, mindfulness was known as "Sati" in Pali and was translated into English by scholars in 1921 as mindfulness (Kabat-Zinn, 2010). In the beginning, monks in temples used meditation to awaken inner concentration every day in their practice, so as to cultivate their inner mind and make their inner peace. The Zazen meditation used by the monks was the prototype of the mindfulness Kabat-Zinn mentioned. Many practitioners practiced mindfulness daily for the purpose of alleviating personal pain and achieving self - awareness. Mindfulness had been regarded as the core of closed - eye meditation in Buddhism (Kabat-Zinn, 2010). To sum up, the original intention of mindfulness was that individuals needed to connect with themselves, understand what was happening and be able to focus on what was happening, actively and constantly maintain self - awareness, so as to help individuals reduce physical and psychological pain (Fabrizio, 2009). In the early days, some scholars (Baltzell and Summers, 2017; Thera, 1994) regarded mindfulness as a cognitive state. Brantley and Kabat-Zinn (2007) saw mindfulness as a kind and non - critical awareness of the present that could help us free ourselves from anxiety and panic. Scholars Bishop et al. (2004) regarded mindfulness as a state trait, emphasizing that mindfulness was an individual's self - control over the current emotion, thinking, attention

and behavior, and an experiential - oriented acceptance of the present experience with openness, curiosity and acceptance. In addition, some scholars (Davidson, 2010; Waal et al., 2025) regarded mindfulness as a mental state and mental trait, which could be used to regulate anxiety and other negative emotions. Kabat-Zinn (2010) believed that mindfulness was a kind of awareness emerging from purposeful and non - judgmental focus on the present moment, that is, individuals paid attention to the current internal and external experience, behavior or thoughts, etc., and did not judge the current feeling, emphasizing attention to the present moment. At that time, Kabat-Zinn's definition of mindfulness was more widely used.

In addition, mindfulness (Zhang, 2016; Cao et al., 2025) could be further divided into state mindfulness, trait mindfulness and process mindfulness from three aspects: state mindfulness, trait mindfulness and process mindfulness. Among them, state mindfulness (Brown and Ryan, 2003) referred to mindfulness as a mental state or mental attribute manifested within or between individuals, and emphasized a state of attention on what was happening at the moment. Trait mindfulness (Mesmer - Magnus et al., 2017) referred to a state in which the perceiver obtained persistence of mindfulness in emotion, emotion, thinking, and behavior. Mesmer - magnus et al. believed that although mindfulness had fluidity and persistence, it could also become an inherent trait of individuals and could be solidified. In other words, mindfulness training could help individuals to acquire trait mindfulness, and it could become a stable and lasting skill inherent to individuals (Mrazek et al., 2012; Mrazek et al., 2013). However, process mindfulness emphasized a dynamic process of adjusting individual attention through training to achieve a mindful state (Zhang, 2016).

To sum up, different scholars had different views on the definition of mindfulness. However, most scholars emphasized the commonality of the definition of mindfulness, which was a kind of awareness of what was happening in the present moment. In this study, researchers defined mindfulness as an individual's awareness and acceptance of everything experienced at the moment with a beginner's curiosity, non - judgment, acceptance and openness, and awareness of the feelings and changes brought by the things experienced at the moment.

2.6.1 Mindfulness Related Mechanisms

The mechanisms of mindfulness mainly included the mindfulness binary model of the attention system, the re-perception model and the mindful coping model.

(a) Mindfulness binary model of attention system

This model was proposed by Bishop et al. (2004) by combining related concepts of mindfulness and attention - related models. According to Bishop et al. (2004), individual attention could be regulated by mindfulness training, which could make individuals stay alert for a long time. In particular, mindful breathing exercises could help individuals focus on the breath, help individuals become aware of the current state, and then more easily help individuals monitor thoughts, emotions and other content in the stream of consciousness. Although the individual could continuously pay attention to and monitor consciousness, it might lead to the inhibition of deeper thinking, that is, the inhibition of secondary thinking processing, due to the conversion and inhibition of secondary thinking processing in the process of self - regulation of attention. Therefore, individuals needed to have flexible attention switching ability. That is, when an individual detected an influx of emotion or other thoughts during mindfulness training, the individual needed to immediately switch his

attention to breathing. In addition, individuals needed to keep an open attitude, not judge the emotions and thoughts flooding into the brain with a beginner's mind, and accept them, so that the tolerance of individuals to negative emotions would also be strengthened.

(b) Re-perception model

This model was originally proposed by Shapiro et al. (2010) in 2006 based on the previous definition of mindfulness. Shapiro et al. specified the functional elements of mindfulness as intention, attention, and attitude, and proposed a re - perception model with four mechanisms: self - control, value purification, cognition, emotion, behavioral flexibility, and exposure. According to this model, the training of mindfulness meditation involved the processing process of the individual's attention, and then the individual produced re - perception. The attitude of the individual to accept and not judge what was happening in the moment helped to reduce the automatic response of the individual to thoughts, emotions and feelings. Meta - cognition played an important role in the re - perception model. Meta - cognition could be changed to reduce the control of immediate emotions on individuals and a series of automatic habitual responses.

(c) Mindful positive coping model

This model was proposed by Garland et al. (2009). This model considered mindfulness as a meta - cognitive form of consciousness, including decentralized processes and changes in cognitive sets. According to the model, when an individual encountered a stressor, the individual would first make an initial assessment of the stressor. When an individual was unable to cope with the impact of the stressor on the individual, the individual would re - evaluate the stressor, and then the individual would respond to the negative event with decentralized or de - automated thinking, and the focus would be shifted from the

content of consciousness to the dynamic process of consciousness. In this process, it was helpful for the individual to expand the scope of attention, and then improve the flexibility of individual cognition. At the same time, this process contributed to the expansion of individual meta - cognitive states and enabled individuals to re - evaluate negative events with a positive attitude at the cognitive level. In turn, this process would help individuals to redefine or reconstruct negative events, and ultimately help individuals generate positive emotions that could alleviate negative events.

To sum up, when individuals encountered NLE, they accepted rather than avoided the current events through repeated evaluation of NLE. The attitude of non - judgmental acceptance of NLE could help to reduce the automatic response of individuals to thoughts, emotions and feelings, improve the level of individual ML, and then reduce or improve the stress response of individuals.

2.7 Relationships among NLE, ML, PSS, SA and CPA

The researcher conducted literature reviews on the relationships between NLE, ML, PSS, SA and CPA respectively.

2.7.1 NLE and ML

There were few studies on the relationship between NLE and ML. By reviewing the literature, there were only a few studies on the relationship between NLE and ML. For example, Chinese scholar Teng et al. (2017) tested 2794 students with the Five - Factor Mindfulness Awareness Scale, Adolescent Life Events Scale, and Inhibition and Sleep Related Scale to explore the relationship between mindfulness, life events, depression and sleep. The results showed that the score of mindfulness was negatively correlated with the score of NLE, and mindfulness and sleep played a chain mediating role between NLE and

depression. Most of the studies explored the relationship between specific life events and ML, such as exams, interpersonal problems, academic prospects, life adaptation, etc. Examination, interpersonal relationship, academic future, life adaptation, heterosexual communication, self - actualization and support from relatives and friends were common NLE of college students (Zhao & Chen, 2010). According to the mindful positive coping model (Garland et al., 2009), NLE belonged to stressors in this model. When an individual was unable to cope with the impact of the stressors, the individual would reevaluate the NLE and cope with the negative events with decentralized or deautomated thinking, to improve the individual's cognition of NLE, further help individuals to redefine or reconstruct negative events, and finally generate positive emotions to alleviate NLE. Furthermore, the psychological stress system model proposed by Jiang (Junlin et al., 2001; Qianjin, 2004; Shujiao et al., 2013) also pointed out that stressors could generate stress responses through the action of mediating or intermediate factors, which included cognitive evaluation. Studies had shown (Peng et al., 2023) that a high level of mindfulness might cause an individual to pay more attention to the use of various mobile phone software and be immersed in the present state. Such unconscious attention preference and attention detachment difficulties would lead to serious mobile phone addiction, which would further lead to college students' dependence on mobile phones. From the definition of mindfulness, it could be seen that mindfulness belonged to the category of cognitive evaluation. Therefore, it could be concluded that NLE could play a role in stress response through the mediating or intermediate factor of mindfulness. Current studies mainly took ML as a mediating factor to explore the relationship between NLE and other variables. Future studies on the relationship between NLE and other variables could be further enriched.

2.7.2 NLE and PSS

Chinese scholar Zhou et al. (2022) used the Adolescent NLE Scale, Relative Deprivation Questionnaire, PSS Scale, and Mobile Phone Addiction Scale to measure the relationship between NLE, sense of relative deprivation, PSS and mobile phone addiction. The results showed that the score of NLE was negatively correlated with PSS, and PSS and sense of relative deprivation played a mediating role between NLE and CPA. Chinese scholars Luo et al. (2020) tested 265 pregnant women with related scales to explore the relationship between life events, PSS, anxiety, depression and happiness. The research conclusion showed that PSS was helpful to improve the subjective well - being of pregnant women. Xiao (2018) used the adolescent life events scale, Chinese Internet Addiction Scale and Realize Social Support Scale to conduct a questionnaire survey on 600 first - year students at school. The results showed that life events had a significant negative correlation with three factors: realized social support, family support, and peer support and other support, and PSS played a mediating role between life events and CPA. The threat model of social support suggested that individuals who had experienced NLE would reduce others' perception of social support (Luo et al., 2020; Kok et al., 2025). Social bonding theory (Hirschi, 1969) also pointed out that when an individual experienced a negative life event, if he or she was recognized by his or her parents, peers, family, school, work unit or social institutions closely related to the individual, the likelihood of his or her engaging in crime and related behaviors would be reduced. Similarly, the main - effect model (Tiegs, 2010) suggested that social support had a general beneficial effect on the physical and mental health of individuals, not only in the presence of stressors, but also in daily life. It could be concluded that NLE could play a role in stress response through the perception of social support as a mediator or intermediate factor. At that time, there were many studies on NLE

and PSS, but most of them used PSS as a mediating factor to explore the relationship between NLE and other variables.

2.7.3 NLE and SA

Chinese scholars Huang et al. (2013) used the SA and Distress Scale and the Adolescent Life Events Scale to conduct a questionnaire survey on 494 college students, and the results showed that NLE were significantly positively correlated with SA. The more NLE college students experienced, the more likely they were to have SA. Chinese scholars Liang et al. (2004) manifested that NLE were related factors affecting SA of college students and there was a significant positive correlation between them. Zhao and Ye (2019) took NLE as independent variables, SA and distress as dependent variables, and inadequacy feeling as an intermediate factor to explore the relationship between the two, and the research results showed that inadequacy feeling played a mediating role between the two. In addition, some scholars (Gao et al., 2020) took NLE as independent variables, perceived deficits and SA as intermediate variables, and depression as a dependent variable to explore the relationship among the four. And the results also showed that NLE were positively correlated with SA, and inadequacy feeling and SA played a mediating role in the relationship between NLE and depression. According to the psychological stress system model (Wu et al., 2001; Jiang, 2004; Yao et al., 2013), stressors could generate stress responses through mediating or intermediate factors, among which the mediating or intermediate factors in this model included coping style. According to the definition of SA, it could be seen that SA was a kind of avoidance behavior made by individuals in the social process in the face of NLE that they could not cope with. It could be concluded that NLE could play a role in stress response through SA as a mediator or intermediate factor.

2.7.4 NLE and CPA

Chinese scholar Zhou et al. (2022) used the Adolescent NLE Scale, Relative Deprivation Questionnaire, PSS Scale and Mobile Phone Addiction Scale to investigate the connection between NLE, relative deprivation, PSS and mobile phone addiction. And the results evinced that the score of NLE was positively correlated with the score of relative deprivation and CPA, and the direct effect of NLE on CPA was statistically significant. Also, the mediating effects of PSS and perceived sense of relative deprivation on the relationship between NLE and CPA were statistically significant. In conclusion, for college students who had experienced NLE, we could start from building a social support system which was helpful to reduce the mobile phone addiction of college students. He et al. (2021) conducted a two - stage longitudinal follow - up of 604 adolescents for 6 months to explore the stability of adolescent life events and CPA, the correlation between the two variables and the predictive relationship. And the results showed that there was a close correlation between adolescent life events and CPA. Both life events and CPA had certain stability, and adolescents' life events could predict CPA. Cao (2021) investigated the relationship between NLE and CPA among higher vocational college students and drew similar conclusions that NLE could significantly predict CPA. It could be concluded that college students' NLE could predict CPA. According to the psychological stress system model (Wu et al., 2001; Jiang, 2004; Yao et al., 2013), NLE were the stressors in the model, and CPA was the stress response in the model, and the stressors could generate stress responses through mediating or intermediate factors. Thus, it could be inferred that the relationship between NLE and CPA might play a role through some mediating or intermediate factors.

2.7.5 ML and CPA

There were few studies on the relationship between mindfulness and CPA. Most of them used mindfulness training to intervene the subjects, in order to explore the impact of mindfulness training on CPA. The results showed that a high level of mindfulness was helpful to reduce the individual's CPA. Chinese scholar Zhou and Chen (2022) used convenience sampling method to conduct a questionnaire survey among 409 college students to explore the relationship between mindfulness, mobile phone addiction and sleep quality. And the results attested that mindfulness traits were negatively correlated with CPA and sleep quality. The research results of Chinese scholar Li (2020) also showed that college students' mindfulness had a high predictive effect on CPA, and mindfulness intervention was helpful to reduce CPA among college students. Yang (2021) also reached the similar conclusion above, namely, there was a significant negative correlation between the overall level of trait mindfulness and CPA (Liang et al., 2024), and trait mindfulness of college students could predict CPA. In addition, studies had shown (Peng et al., 2023) that a high level of mindfulness might cause an individual to pay more attention to the use of various mobile phone software and be immersed in the present state. Such unconscious attention preference and attention detachment difficulties would lead to serious mobile phone addiction. In the future, research on the relationship between mindfulness and CPA could be further enriched.

2.7.6 PSS and CPA

Chinese scholar Zhou et al. (2022) used the Adolescent Negative Life Events Scale, Relative Deprivation Questionnaire, PSS Scale, and Mobile Phone Addiction Scale to examine the association between NLE, relative deprivation, PSS and mobile phone addiction. The results showed that the PSS score and the CPA score were negatively

correlated, and PSS played a mediating role between NLE and CPA. Chinese scholar Wang et al. (2015) used the CPA Scale, Social Support Scale and Subjective Well - being Scale to conduct a questionnaire survey on 1420 students in order to explore the characteristics of CPA among college students and the relationship between PSS and subjective well - being. The research results showed that PSS was closely related to CPA, and PSS partially mediated the relationship between CPA and subjective well - being. In addition, some scholars (Tu, 2016) showed that the PSS of college students could significantly negatively predict CPA. According to the theory of social bonding (Hirschi, 1969), when an individual encountered a negative life event, if it was recognized by parents, peers, family, school, work unit or social institutions closely related to the individual, it could reduce the individual's involvement in crime and related behaviors. In conclusion, PSS could predict CPA.

2.7.7 SA and CPA

There were researches on the relationship between CPA, which mainly discussed social problems such as social anxiety and social disorder. Chinese scholar Wu et al. (2022) explored the relationship between security, SA and mobile phone addiction in college students. The results showed that the mediating effect of SA was only significant in the security and CPA of mobile phone addicts, but not in the general mobile phone users. Chinese scholars Zhang et al. (2018) studied 520 undergraduate students to explore the predictive effects of loneliness, security, immersion and SA on mobile phone addiction. The results manifested that SA could significantly predict mobile phone addiction. Moreover, loneliness, security and immersion played a complete mediating role between SA and mobile phone addiction. Some scholars (Ye et al., 2017) used SA as an intermediate variable and CPA as a dependent variable to explore the relationship between SA and emotional regulation difficulty and CPA. The results showed that SA was a mediating variable between

emotional regulation difficulty and mobile phone addiction in college students. According to Maslow's Hierarchy of Needs Theory (Maslow, 1943), interpersonal communication was the most basic need of individuals. Individuals could not meet these needs in real life, so they would get these needs through the Internet or whatever. Therefore, college students with SA and distress were likely to rely on mobile phones for a long time to meet the needs of interpersonal communication, which led to their dependence on mobile phones. It could be concluded that SA could predict CPA to some extent. At that time, there were few studies on the relationship between SA and CPA at home and abroad. The research on the relationship between SA and CPA could be further enriched in the future.

2.8 Theoretical Basis

The theories used in this study mainly included Psychological Stress System Model.

2.9 Theoretical Framework

The psychological stress system model emphasized that the basic idea of the stress reaction process was the process from stressor to stress reaction. That is, under the influence of stress sources, an individual, through the mediating roles of many factors such as cognitive appraisal, coping styles, social support, and personality traits, eventually had psychological, physiological, and behavioral responses, which was also known as the "stress process model". The model was composed of stressors, stress responses, and stress factors, which interacted with each other as cause and effect. This study took the psychological stress system model proposed by Jiang (Jiang, 2004; Wu et al., 2001; Yao et al., 2013) as the main theoretical basis of this study. It took NLE as a source of stress and CPA as a stress response to explore the relationship among NLE, ML, PSS, SA, and CPA. The picture was shown as in Figure 2.2.

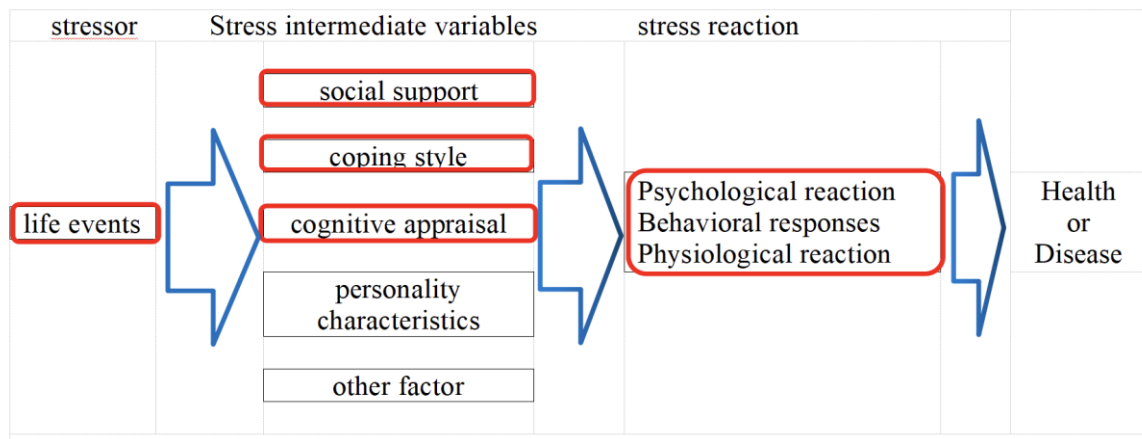


Figure 2.2: Psychological Stress System Model (The Theoretical Framework of The Research)

2.10 Conceptual Framework

Based on the above theories and models, the NLE in this study were a kind of stressor. When individuals encountered NLE and did not receive positive attention and social support from others, it might lead to uncomfortable feelings. In order to alleviate the uncomfortable feeling caused by NLE and the frustration they might face in the process of social interaction, individuals might use mobile phones as a medium to engage in SA behavior. Through the medium of mobile phone, individuals could obtain certain psychological comfort, which further promoted the frequency and time of using mobile phones, and then led to the occurrence of mobile phone addiction behavior. Conversely, when individuals had NLE, if they regarded the NLE as a challenge and opportunity, when an individual faced NLE, changed the individual's negative cognition of NLE, or accepted the present moment, focused on the present moment, or had certain social support provided for them, they could bravely face NLE, so as to achieve the purpose of improving mobile phone addiction behavior.

This study took the psychological stress system model proposed by Jiang as the main theoretical basis of this study. In this study, stress response mainly included mental, physical, and behavioral aspects, and college students' CPA also included psychological, physical, and behavioral aspects. When individuals encountered NLE, they escaped social interaction through the medium of mobile phone, which further led to the outcome of individual CPA. On the contrary, when individuals encountered NLE, they accepted NLE with a normal mind and changed their cognition of NLE. They regarded NLE as a challenge or opportunity. At the same time, certain social support should have been provided for individuals to improve their own PSS ability, so that individuals could bravely face NLE and individual SA could be alleviated, and thus individual mobile phone addiction behavior would be reduced.

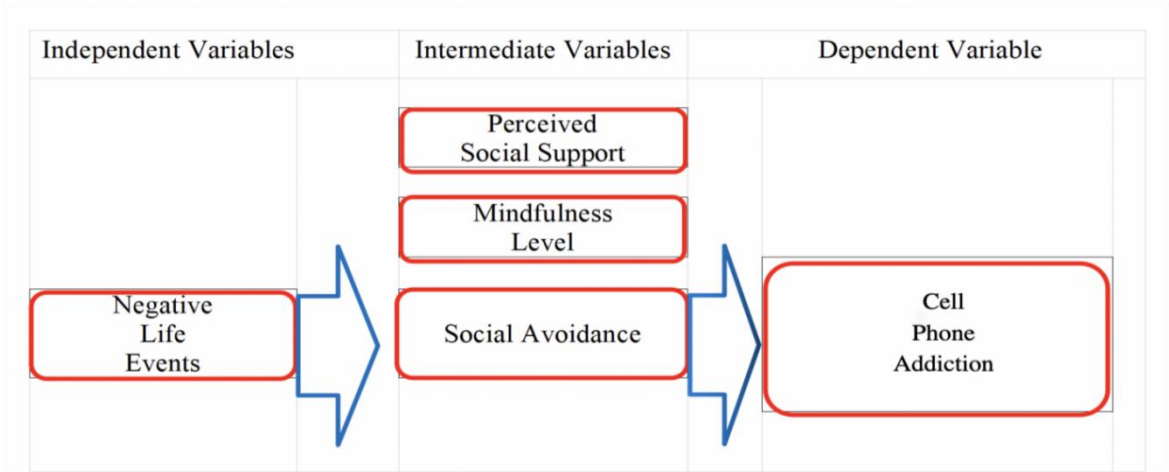


Figure 2.3: Conceptual Framework

According to the psychological stress system model, cognitive evaluation, social support and coping styles were intermediary system factors. That is, mindfulness, PSS, SA were the intermediary factors in the model, and this study considered that a stress process was the adjustment of these three factors: mindfulness, PSS and SA. Starting from the stress

response in this theoretical model, this study took NLE as a stressor and college students' CPA as a stress response to explore the relationship among NLE, ML, PSS, SA and CPA.

Based on the literature review, a conceptual framework was designed as above. It described the relationship among NLE, ML, PSS, SA and CPA.

2.11 Chapter Summary

In this chapter, the researcher, through the review of domestic and international literature, mainly elaborated on the concepts, common theories and correlations among NLE, ML, PSS, SA and CPA. It further elaborated in detail the basic theoretical framework of this study as well as its theoretical and practical significance. The next chapter would elaborate in detail on the methodology of the research.

CHAPTER 3

METHODOLOGY

3.1 Overview

This chapter contained the overview of the methodology used in the research. In this chapter, the design of the research, population and sampling techniques, sample size, research instrument, variables, data analysis, pilot study, common method bias, reliability and validity, normality, the procedure of data collection, and ethics of the study were discussed.

3.2 Research Design

This study was quantitative in nature with a correlational research design involving college students. Descriptive statistics, Pearson Correlation Product Moment, and Structural Equation Modelling were used to analyze the collected data. The descriptive analysis consisted of frequency, percentage, maximum, and minimum values. This research studied the relationship between independent variables (NLE), intermediate variables (ML, PSS, and SA), and dependent variables (CPA). And the Structural Equation Model was adopted to conduct a mediating analysis of the five variables.

3.3 Population and Sampling

The participants of this research included college students from Zhejiang Guangsha Vocational and Technical University of Construction. The total population of college students from this university was 15,000 and the total sample size was a minimum of 473. Data were collected by using the software Questionnaire Star for the survey.

3.3.1 Population

The survey sample in this study included four - hundred and seventy - three (473) college students from Zhejiang Guangsha Vocational and Technical University of Construction. The researcher only chose freshmen, sophomores, and junior college students, because it was difficult to control the senior college students who needed to leave the campus and enter various units for internship.

3.3.2 Sampling

(a) Selection Criteria

Inclusion Criteria: a) Aged 18-24 years; b) Full-time undergraduate students; c) Volunteer to participate in this study. Exclusion Criteria: a) Suspension or withdrawal; b) Physical inconveniences to participate in the study; c) Students with mental illness and suicidal ideation.

(a) Sample Size

- i. Calculated according to the influencing factors

According to the influencing factors, the sample size should have been at least 5 - 10 times the number of variables (Hou, 2004). On the basis of 200 people (Hou, 2004), each additional variable should have increased the sample size by at least 5 - 10 people. There were a total of 23 variables in this study. On the basis of 200 people (Hou, 2004), by adding 10 people for each variable, 430 people were needed in total. Considering 10% of the invalid questionnaires and the stability of the model, the sample size was preliminarily determined as 473.

ii. Calculating Pearson Product-Moment Correlation Coefficient

This research studied the influence of independent variables (NLE, ML, SA and PSS) on dependent variables (CPA) by using multiple regression analysis. The following were some formulas proposed by different founders when calculating the sample size estimates for this study.

Firstly, Steven (1986) suggested that under the condition of $\alpha = 0.05$ and power = 0.8, the suitable n/k ratio was 1:15. The ratio n/k represented the ratio between the number of predictor variables and the number of subjects required for each predictor variable based on Steven's (1986) formula. In this study, there were four independent variables and thus the sample size calculation was 4×15 . According to Steven's formula, the minimum sample size was finally calculated to be 60.

Secondly, Cohen (1992) suggested that under the condition of $\alpha = 0.05$ and power = 0.8, the suitable n/k ratio was 1:20. And under the condition of a medium effect size, the minimum of the sample size for multiple regression was 76. However, in this research, a minimum of 80 respondents were required to carry out the Pearson Product - Moments Correlation Coefficient.

Thirdly, according to Tabachnick and Fidell's (2013) formula ($N > 50 + 8m$, where the letter m stands for the number of independent variables), the minimum sample size was finally calculated to be 82.

To achieve an adequate sample size and fulfill the minimum sample requirement, according to the sample size calculation formulas proposed by different scholars, Steven (1986) gave 60, Cohen (1992) gave 80 and Tabachick and Fidell (2013) gave 82.

To sum up, based on Hou (2004), Cohen (1992), Tabachnick and Fidell (2013) and the sample size calculations, the number of respondents determined for this research was 473. This was to achieve an adequate sample size by using the calculation methods of influencing factors, the pearson product moment correlation coefficient and regression analysis. In other words, the number of college students in the study was 473.

(c) Sampling Technique

The sampling technique used in this study was stratified random sampling. Stratified random sampling was used to determine the required sample size from Zhejiang Guangsha Vocational and Technical University of Construction. According to Creswell (2012), stratified random sampling is a probabilistic sampling that divides a population into a small number of subgroups with certain characteristics. Then, samples were selected proportionally according to subgroups (strata). Besides, Ary et al. (2010) also showed that stratified sampling helped researchers identify possible differences between subgroups. Stratified samples could make the sample more representative and more suitable for studies with small sample sizes. Creswell (2012) stated that a stratified sampling technique was used when the population reflected the unequal characteristics of the sample. In this study, the characteristics involved were Grades (Freshman, Sophomore and Junior) and Faculties. As of 2022, Freshman had 1980 college students, while Sophomore had 1540 college students and Junior had 1375 college students. Therefore, stratified sampling provided equal opportunity for sample data to be selected, and data were not overrepresented or dominated by specific groups in the population (Ary et al., 2010). As a result, the number of samples on simple calculation for each Grade and Faculty was as follows.

Based on the proportional stratified sampling technique, $nh = (N_h / N) * n$ was the formula (StatTrek, 2017). According to StatTrek (2017), nh represented the sample size of each stratum, N_h represented the population of each stratum, N represented the total population and n represented the total sample size.

Table 3.1: Calculation of Proportionate Sampling by Faculty

Name of Faculty	Grade	Proportion of Sample (strata sample size)
Architectural Engineering Faculty (AEF)	Freshman: 500	128/1,330
	Sophomore: 490	
	Junior: 340	
Management Engineering Faculty (MEF)	Freshman: 405	90/910
	Sophomore: 290	
	Junior: 215	
Information and Control Engineering Faculty (ICEF)	Freshman: 375	80/825
	Sophomore: 240	
	Junior: 210	
International Business Faculty (IBF)	Freshman: 340	90/940
	Sophomore: 230	
	Junior: 370	
Art and Design Faculty (ADF)	Freshman: 360	85/890
	Sophomore: 290	
	Junior: 240	
Total		473/4,895

Table 3.2: Number of Sample by Grade

Name of Faculty	Grade	Proportion of Sample (strata sample size)	Equation	Number
Architectural Engineering Faculty (AEF)	Freshman: 500	48/1,330	$nh = (500/1330) \times$	$nh = 48.1 = 48$
	Sophomore: 490	47/1,330	$nh = (490/1330) \times$	$nh = 47.1 = 47$
	Junior: 340	33/1,330	$nh = (340/1330) \times$	$nh = 32.7 = 33$
Management Engineering Faculty (MEF)	Freshman: 405	40/910	$nh = (405/910) \times 90$	$nh = 40.1 = 40$
	Sophomore: 290	29/910	$nh = (290/910) \times 90$	$nh = 28.7 = 29$
	Junior: 215	21/910	$nh = (215/910) \times 90$	$nh = 21.3 = 21$
Information and Control Engineering Faculty (ICEF)	Freshman: 375	36/825	$nh = (375/825) \times 80$	$nh = 36.4 = 36$
	Sophomore: 240	23/825	$nh = (240/825) \times 80$	$nh = 23.3 = 23$
	Junior: 210	20/825	$nh = (210/825) \times 80$	$nh = 20.36 = 20$
International Business Faculty (IBF)	Freshman: 340	33/940	$nh = (340/940) \times 90$	$nh = 32.6 = 33$
	Sophomore: 230	22/940	$nh = (230/940) \times 90$	$nh = 22.0 = 22$
	Junior: 370	36/940	$nh = (370/940) \times 90$	$nh = 36.4 = 36$
Art and Design Faculty (ADF)	Freshman: 360	34/890	$nh = (360/890) \times 85$	$nh = 34.4 = 34$
	Sophomore: 290	28/890	$nh = (290/890) \times 85$	$nh = 27.7 = 28$
	Junior: 240	23/890	$nh = (240/890) \times 85$	$nh = 22.9 = 23$

Based on the proportional stratified sampling technique, a total of at least 473 samples were required. The number of samples for each Faculty and Grade was shown as above.

3.4 Instruments

The researcher mainly introduced the common scales of NLE, ML, PSS, SA and CPA as well as the scales used in this study.

3.4.1 Common Scales of Each Variable

This research primarily conducted an induction and synthesis of prevalent scales, and after a comparison, identified the most appropriate research scale for use in this study.

3.4.1.1 CPA Related Scales

The CPA related scales are described as follows:

(c) CPA Inventory (CPAI)

The scale was developed by Xu et al. (2008), based on DSM - IV and substance dependence and behavioral addiction, through interviews with 300 college students in Beijing. The scale consisted of 13 questions and was divided into 4 dimensions. The four dimensions of the scale were behavioral tolerance, behavioral withdrawal, social function and physiological response. The internal consistency coefficient of the scale was 0.50, and the internal consistency α coefficient of each component ranged from 0.50 to 0.59. This scale had a certain reliability, but it was not too high, and it still needed to expand the sample size for further testing.

(d) Mobile Phone Addiction Index (MPAI)

The Chinese version of MPAI was developed by Leung et al. (2007) of the Chinese University of Hong Kong in 2008 based on the DSM - IV and Young criteria for Internet addiction. The scale had 17 items and 4 dimensions for measuring subjects aged between 14 and 28. The scale had a minimum score of 17 and a maximum score of 85. The scale contained four dimensions: abstinence, loss of control, avoidance and inefficiency. The internal consistency α coefficient of the scale was 0.882, and the α coefficients of each subscale ranged from 0.71 to 0.80. The scale had good reliability, and had been extensively applied in the investigation of college students' mobile phone addiction.

(e) Questionnaire on Mobile Phone Addiction Tendency of College Students

The questionnaire was compiled by Tu et al. (2010) through interviews with 500 college students. From the perspective of "type - addiction tendency", it included three dimensions: mobile phone entertainment addiction, mobile phone relationship addiction, and mobile phone information collection addiction. The internal consistency α coefficient of the questionnaire was 0.92, and the subscale α coefficients were 0.86, 0.84 and 0.77, respectively. Although the reliability and validity of the questionnaire were good and met the requirements of various psychometric indicators, and it could be used as a measurement tool for the follow - up research of college students' mobile phone addiction tendency, a large number of clinical trials were still needed.

(f) Mobile Phone Addiction Tendency Scale of College Students (MPATS)

The scale was developed by Chinese scholar Xiong et al. (2012) by referring to the basic symptoms of Internet addiction proposed by Young to measure 641 college students. The scale consisted of 16 questions and 4 dimensions. The four dimensions of the scale were

highlighting behavior, withdrawal symptoms, social comfort and mood change. The Cronbach α coefficient of the scale was 0.83, and the internal consistency α coefficient of each component ranged from 0.55 to 0.80. The reliability and validity of the scale were good, and it could be used in the problems related to addiction tendency of future college students.

(g) Self-Rating Questionnaire for Adolescent Problematic Mobile Phone Use

This questionnaire was compiled by Tao et al. (2013) based on the mobile phone use of college students. The questionnaire had 13 questions, including 3 dimensions. The three dimensions of the questionnaire were designed around withdrawal symptoms, craving and physical and mental effects. Each question in the questionnaire had 5 options, with a minimum score of 13 and a maximum score of 65. The higher the score, the higher the degree of dependence on mobile phones. The questionnaire had good reliability and validity, and the questions involved in the questionnaire were relatively comprehensive, which could better reflect the dependence of mobile phone use among Chinese adolescents.

(h) Smartphone Addiction Proneness Scale for Adolescents (SAPS)

This Scale was developed by Zhang and Liu (2021) based on the Smartphone Addiction Scale - Short Version. The internal consistency coefficient of SAPS was 0.812, and the test - retest reliability was 0.660. The Chinese version of the scale had good reliability and validity and could be used as a screening tool for adolescent CPA. However, a large number of clinical trials were still needed.

(i) Problem Mobile Phone Use Scale (PMPUS)

This scale was developed by Bianchi et al. (2005) according to individuals aged 18 to 85 who owned or used mobile phones frequently. The internal consistency α coefficient

of the scale was 0.93. Although the internal consistency coefficient of the scale was high, the scale had a wide range of tested population and was not targeted.

(j) Problem Mobile Phone Use Questionnaire (PMPUQ)

The Problem Mobile Phone Use Questionnaire was developed by Billieux (2010) after interviewing people in the community. It had 30 items and 4 dimensions. The scale included four dimensions: prohibition of use, dangerous use, dependence and financial problems caused by use. The α coefficients of internal consistency were 0.65, 0.73, 0.84 and 0.85, respectively. This scale was more inclined to detect the CPA of community people.

So far, there had been many scales related to CPA, such as the scale compiled by Chinese scholars Du et al. (2009), the smartphone addiction Scale adapted and revised by Su et al. (2014). Through literature review, it was found that scholars were more inclined to use self - assessment questionnaires or scales with strong subjectivity. Based on the characteristics of the subjects, the reliability and validity of the scale and the use of the scale, we finally decided to use the College Students' Mobile Phone Addiction Tendency Scale compiled by Xiong et al. (2012).

3.4.1.2 Negative Life Events Related Scales

The life events related scale could be used to detect various life events experienced by individuals in a certain period of time, and to assess and evaluate the stress intensity of life events experienced. The related scales were as follows:

(a) Social Read Justment Rating Scale (SRRS)

This scale was developed by Holmes and Rahe (1967), psychiatrists from Washington University School of Medicine, the United States, through quantitative research

on life change units. It was the first scale to measure life events so far. There were two versions of the scale, 39 questions for minors and 43 questions for adults. The adult version listed 43 typical life events, with the top five being the death of a spouse, divorce, couple separation, criminal or incarceration, death of a relative and retirement. Holmes and Rahe investigated 5000 people and found that life change units were closely related to diseases, including myocardial infarction, stroke, sports injury, tuberculosis, work - related accidents, leukemia, diabetes and so on. Among them, life change unit referred to the degree of re - adaptation after the occurrence of events. Holmes and Rahe emphasized that when using this scale to evaluate individual life events, the life change unit could be evaluated according to the actual situation of the individual. If the individual's life change unit score was higher, it meant that the existing life events of the individual would bring more pressure to the individual. This scale was used by scholars to investigate the relationship between the nature, type, frequency, duration of life events and psychosomatic diseases in the early stage.

(b) The Paykels Interview for Recent Life Events (PIRLE)

The scale (Radosavljević et al., 1996) was developed by Paykel in 1971 and included 61 life events. The participants were asked to name any important events not included in the list of life events. The scale included four additional events, including whether they or a relative had been involved in a war, whether they had been directly exposed to a dangerous experience, whether they or a close relative had been divorced, and whether they or a close relative had been involved in a traffic accident. The scale was not easy to complete.

(c) Life Experiences Survey (LES)

This scale was developed by Sarason and Johnson (1976) on the basis of Holmes Social Readjustment Scale. The scale contained 57 common life events that may have been

experienced or required readjustment, 47 of which were about events experienced in the past year, and 10 items were about events that might be experienced by students. The scale required the participants to indicate whether the life events they had experienced were positive or negative, and divided the score into three parts: positive score, negative score and total score. The scale was closer to people's real life.

(d) Life Event Checklist (LEC)

This scale was compiled by Brand and Johnson (1982). It had 4 dimensions and a total of 46 questions. The scale evaluated 46 common life events. For each item, participants were required to answer the following two questions: i) whether the event had occurred within the past year; ii) whether the event was rated as good or bad. The four dimensions of the scale were negative uncontrollable negative events, negative events related to family life, negative events related to self, and negative events related to peer group. The results of the scale showed that the higher the score, the greater the individual stress.

(e) Life Event Scale (LES)

This scale was developed by Zhang et al. (1987) on the basis of Holmes Social Adaptation Scale. The scale consisted of 48 questions, covering work and study, family life, social interaction and other three aspects. In addition, there were two blank items, which could be filled in by individuals according to their actual situation. The scale only included acute life events, not persistent stimuli. The scale had been used in clinical studies in China and other related studies.

(f) Adolescent Self-Rating Life Events Checklist (ASLEC)

This scale was compiled by Liu et al. (1997). The scale included 27 NLE and 6 dimensions. The six dimensions of the scale included interpersonal relationship, learning pressure, college pressure, punishment, loss of relatives and assets, health and adaptation, and other factors. The scale had good reliability and validity, and had been widely used by Chinese scholars to evaluate NLE of Chinese students and college students. This scale was tested on 1473 middle school students, and the results showed that the reliability and validity of this scale were good. The Cronbach coefficient of internal consistency was 0.849, the split - half reliability coefficient was 0.881, and the retest correlation coefficient after one week was 0.686. The evaluation period of the scale could be set as 3, 6, 9 or 12 months according to the study. To evaluate the participants, the researcher first determined whether the participants had any knowledge of each event that had occurred within the time limit. If it did not occur, the score was 0. If yes, the subjects were scored on a 5 - point scale according to their psychological feelings when the event occurred. The scale had a minimum score of 0 and a maximum score of 135. Researchers could divide the total score into 5 levels according to the classification criteria, ranging from 0 to 27, which indicated that individuals were almost unaffected by life events. A score of 27 to 54 indicated that the life events suffered by the individual had a slight impact on the individual. A score of 54 to 81 indicated that the life events suffered by the individual had a moderate impact on the individual. A score of 81 to 108 indicated that the life events suffered by the individual had a severe impact on the individual. A score of 108 to 145 indicated that the life event suffered by the individual had a very severe impact on the individual.

(g) Chinese College Students Psychological Stress Scale

This scale was compiled by Liang et al. (2005). It contained 85 items and 5 dimensions, covering various aspects such as common life events and daily trivialities suffered by college students. Among them, the five dimensions of the scale included study, life, social interaction, development and family. The scale could also be divided into life events subscale and daily life trivia subscale according to the intensity and nature of stressors.

(h) Chinese Military Life Events Scale

This scale (Cui et al., 2010) was a standardized measurement tool used to measure the psychological load of Chinese soldiers and the impact of life events. The scale had a total of 45 items and had good reliability. All items of the scale were NLE, and it was simple and easy to implement. However, at that time, there were few female participants in this scale, and it still had some deficiencies. In the future, it was necessary to expand the types and numbers of arms to test the applicability of the scale.

From the above scales, although there had been many scales for measuring life events and great progress had been made in different populations, some scales still had many shortcomings. For example, Paykels Interview for Recent Life Events and Chinese College Students Psychological Stress Scale had too many questions, and the Chinese Military Life Events Scale tended to favor soldiers. In summary, the object of this study was college students. Considering the reliability, validity, items and dimensions of the scale, the Adolescent Life Events Scale compiled by Liu et al. (1997) was finally decided to be used.

3.4.1.3 Social Avoidance Related Scales

By reviewing the literature, the researchers compared several of the most commonly used SA scales. After weighing the measurement objects, reliability, validity and items of each scale, a scale that was most suitable for this study was finally selected. The scales of SA were as follows:

(a) SA and Distress Scale (SADS)

This scale (Watson & Friend, 1970) was originally developed by Watson and Friend in 1969 according to the social interaction tendency of college students and their distress feelings in social situations. The scale consisted of 28 questions, including 2 dimensions. Two of the dimensions were SA and social distress. The scale had two subscales of SA and social distress, each with 14 test questions. Among them, items 2, 4, 8, 9, 13, 17, 18, 19, 21, 22, 24, 25, 26 and 27 were SA questions, and items 1, 3, 5, 6, 7, 10, 11, 12, 14, 15, 16, 20, 23, 28 were social distress questions. The scale initially used "yes" and "no" answers, and higher scores indicated higher levels of SA or distress. Later researchers tended to use the five - point scale because the five - point scale had a higher α coefficient of nearly 0.90 than the "yes" and "no" scales. In this study, the SA scale of the scale was used, and the scoring method was based on the five - level scoring method. The scale had been widely used in the measurement of college students' SA.

(b) SA Scale for Children (SASC)

This scale was developed by Sang et al. (2016) in the previous study (Coplan et al., 2018; Coplan et al., 2013). The scale had 10 questions, including two dimensions of fear of negative evaluation and SA and distress, with a 5 - point score. The higher the score of the

scale, the higher the level of SA. The scale had good reliability and validity. But the scale was limited in its scope.

(c) Interaction Anxiety Scale (IAS)

This scale (Peng et al., 2004) was developed by Leary and consisted of 15 self-reported questions. It was translated and published by Mental Health Rating Scale Manual and revised into Chinese by Chinese scholar Peng et al. (2004). It was used to measure the social anxiety of individuals in interpersonal communication. The scale consisted of 15 questions, and the higher the total score, the more serious the social anxiety. The scale had good reliability and validity. Compared with SA and Distress Scale, Interaction Anxiety Scale emphasized the measurement of personal anxiety.

In addition to that, there were some scales about SA. For example, Personal Report of Communicating Apprehension (PRCA) was finally revised by McCroskey et al. (1985) based on the original scale in 1985, namely PRCA - 24. The PRCA - 24 scale was composed of four subscales, which were used to measure the degree of communication anxiety or fear of the subjects in four different situations: group discussion, two - person conversation, attending a meeting and public speaking. The scale was more suitable for measuring the tension and fear in the communication of more than two people. And Shyness Scale was proposed by Cheek and Buss (Wang et al., 2009) in 1981, which was mainly used to evaluate the feelings of anxiety and behavioral inhibition in the process of social interaction.

After reviewing the literature, it was found that there were not many measures of SA. Almost all of them came from foreign scholars, and most of them were translated and revised by Chinese scholars. In addition, most of the existing SA scales were considered from the

perspective of social anxiety, which was not strongly targeted. In summary, this study finally decided to use the SA and Distress Scale compiled by Watson and Friend.

3.4.1.4 Perceived Social Support Related Scales

The scales of PSS were as follows:

(a) Perceived Social Support Scale (PSSS)

The perceived social support scale was originally developed by Zimet et al. (1988) to measure the sources of various social support perceived by individuals. The scale consisted of 12 questions and 3 dimensions. The three dimensions in the scale were friend support, family support and other support. Later, Chinese scholars Li et al. (1996) translated the scale and analyzed 206 subjects with malignant tumors. The revised scale still retained the original 12 items, and combined the friend support and other support into one dimension, namely, the dimension of outside family support. The revised version of PSS scale emphasized more on individual self - understanding and self - feeling, and the PSS of individuals was more subjective. The α coefficient of this scale was 0.90. It had been widely used in the study of PSS.

(b) Social Support Revalued Scale (SSRS)

This scale was compiled by Xiao (1994) in 1987. It was mainly used to evaluate the subjective social support, actual social support and the utilization degree of social support. The scale consisted of 10 items and 3 dimensions, including 3 items in the subjective social support dimension, 4 items in the objective social support dimension and 3 items in the social support utilization dimension. In this scale, 8 items were scored by the 4 - level scoring method, and the other 2 items were scored according to the total number of sources. The internal consistency coefficient of the scale was 0.92, indicating good reliability and validity.

In summary, PSS Scale and Social Support Rating Scale were two scales commonly used by Chinese scholars. Based on the characteristics of the subjects and social support scales, the PSS Scale revised by Li et al. (1996), a Chinese scholar, was chosen to measure the PSS of college students.

3.4.1.5 Mindfulness Related Scales

According to literature review, there were many scales for measuring ML, such as The Mindful Attention Awareness Scale (MAAS), The Five Factor Mindfulness Questionnaire (FFMQ), etc. The MAAS and the FFMQ were most commonly used by Chinese scholars. The mindfulness related scales were described below.

(a) Mindful Attention Awareness Scale (MAAS)

This scale was compiled by Brown and Ryan (2003) and was one of the earliest tools used to measure the level of mindfulness, which solved the problem of measuring the level of mindfulness of individuals without mindfulness training experience at that time. The Chinese version of the MASS was developed by scholars Chen et al. (2012) from Beijing Normal University in 2012 to measure 792 undergraduate students with the original scale and conduct confirmatory factor analysis. Two weeks later, 125 college students were retested. The results showed that the scale had good construct validity, Cronbach's α coefficient was 0.890, and the test - retest reliability was 0.870. The results showed that the Chinese version of MASS could be used to measure the ML of Chinese students. Each item in the Chinese version of MASS was a reverse description of the concept of mindfulness. This scale was a single dimension scale with 15 items. The Likert scale point was between 0 to 6 rating, with "always" =1 point, "often" =2 points, "sometimes" =3 points, "occasionally" =4 points, "rarely" =5 points, and "never" =6 points. The total score was 15

to 90. The higher the level of attention and awareness of the present in daily life, the higher the level of mindfulness. The final score of the scale could be divided into three levels, namely, a score of 66 to 90 meant a high level of mindfulness, a score of 41 to 65 meant a medium level of mindfulness, and a score of less than 40 meant a low level of mindfulness. The scale had been used to assess the level of mindfulness.

(b) Five Face Mindfulness Questionnaire (FFMQ)

This scale was compiled by Baer (2006), and then Chinese scholar Deng combined it with Chinese localization to form the Chinese version of the scale. The scale consisted of 5 dimensions. They were observing items, describing items, act aware items, non - judging items and non - reacting to internal experience items, a total of 39 items. The validity of the scale was 0.83, and the test - retest reliability of each dimension ranged from 0.84 to 0.86.

In summary, after comprehensive comparison, the researchers found that the MAAS was more suitable for measuring the ML of Chinese college students, and its reliability and validity were good. Therefore, they finally decided to use the MAAS as a tool to measure the ML in this study.

3.4.2 Research Scale

The research questionnaires were made up of six sections which were Section A: demographic section, Section B: Adolescent Self - Rating Life Events Checklist (ASLEC), Section C: Mobile Phone Addiction Tendency Scale (MPATS), Section D: Mindful Attention Awareness Scale (MAAS), Section E: PSS Scale (PSSS), and Section F: SA Scale (SAS). The details were explained below.

(a) Demographic Questionnaire

This questionnaire consisted of 8 questions with the purpose of collecting demographic information from the participants. The participants were asked for gender, age, whether they were only children, grade, whether they were student cadres, type of major, family structure and family atmosphere. The questions were mostly in single - choice format with no fill - in questions.

(b) Adolescent Self-Rating Life Events Checklist (ASLEC)

This scale was compiled by Liu et al. (1997) and was revised in 1997. The scale included 27 NLE and 6 dimensions. The six dimensions of the scale included interpersonal relationship, learning pressure, college tension, sanction, the deprivation of relatives and assets, health and acclimation and other factors. The scale had good reliability and validity, and had been widely used by Chinese scholars to evaluate NLE of Chinese students and college students.

This scale was tested on 1473 middle school students, and the results showed that the reliability and validity of this scale were good. The Cronbach α coefficient of internal consistency was 0.849, the split - half reliability coefficient was 0.881, and the retest correlation coefficient after one week was 0.686. The evaluation period of the scale could be set as 3, 6, 9 or 12 months according to the study. To evaluate the participants, the researcher first determined whether the participants had any knowledge of each event that had occurred within the time limit. If it did not occur, the score was 0. If yes, the subjects were scored on a 5 - point scale according to their psychological feelings when the event occurred. The scale had a minimum score of 0 and a maximum score of 135. Researchers could divide the total score into 5 levels according to the classification criteria, ranging from

0 to 27, which indicated that individuals were almost unaffected by life events. A score of 27 to 54 indicated that the life events suffered by the individual had a slight impact on the individual. A score of 54 to 81 indicated that the life events suffered by the individual had a moderate impact on the individual. A score of 81 to 108 indicated that the life events suffered by the individual had a severe impact on the individual. A score of 108 to 145 indicated that the life event suffered by the individual had a very severe impact on the individual.

(c) Mobile Phone Addiction Tendency Scale (MPATS)

This scale was compiled by Chinese scholars Xiong et al. (2012) by referring to the basic symptoms of Internet addiction proposed by Young. The scale consisted of 16 questions and 4 dimensions. The four dimensions of the scale were highlighting behavior, withdrawal symptoms, social comfort and mood change. The scale used five points, ranging from "1" (very inconsistent) to "5" (very consistent). The higher the score, the higher the tendency of college students to become addicted to mobile phones. The Cronbach α coefficient of the scale was 0.83, and the internal consistency α coefficient of each component ranged from 0.55 to 0.80. The reliability and validity of the scale were good, and it could be used in the problems related to addiction tendency of future college students.

(d) Mindful Attention Awareness Scale (MAAS)

The MAAS scale was developed by Brown and Ryan (2003) in 2003 and was one of the earliest tools used to measure the level of mindfulness, which solved the problem of measuring the level of mindfulness of individuals without mindfulness training experience at that time. The Chinese version of the Mindful Attention Awareness Scale (MASS) was developed by Chen et al. (2012) from Beijing Normal University in 2012. And 792 undergraduate students were measured with the original scale and confirmatory factor

analysis was conducted. The results showed that the scale had good construct validity, with the Cronbach's α coefficient of 0.890 and the test - retest reliability of 0.870. The results indicated that the Chinese version of MASS could be used to measure the ML of Chinese students. Each item in the Chinese version of MASS was a reverse description of the concept of mindfulness. The scale had been used to assess the level of mindfulness.

(e) Perceived Social Support Scale (PSSS)

This scale was originally developed by Zimet et al. (1988) to measure the sources of various social support perceived by individuals. The scale consisted of 12 questions and 3 dimensions. The three dimensions in the scale were friend support, family support and other support. Later, Chinese scholars Li et al. (1996) translated the scale and analyzed 206 subjects with malignant tumors. The revised scale still retained the original 12 items, and combined the friend support and other support into one dimension, namely, the dimension of outside family support. The revised version of PSS Scale emphasized more on individual self-understanding and self-feeling, and the PSS of individuals was more subjective. In this scale, "leaders" and "colleagues" corresponded to "teachers" and "classmates" respectively. The scale had three dimensions with four questions in each dimension, and the total scale had 12 questions, among which questions 3, 4, 8 and 11 were in the dimension of "family support", and questions 6, 7, 9 and 12 were in the dimension of "friend support". Questions 1, 2, 5 and 10 were in the "other support" dimension. The Likert scale point was between 0 to 7 rating, with higher scores indicating higher levels of PSS. A total score below 36 was considered as low support, a total score between 37 and 60 was considered as medium support, and a total score above 61 was considered as high support. The Cronbach's α coefficient of this scale was 0.90, which had good reliability and validity.

(f) Social Avoidance Scale (SAS)

This scale was originally developed by Watson and Friend (1970) in 1969 according to the social interaction tendency of college students and their distress feelings in social situations. The scale consisted of 28 questions, including 2 dimensions. Two of the dimensions were SA and social distress. The scale had two subscales of SA and social distress, each with 14 test questions, among which items 2, 4, 8, 9, 13, 17, 18, 19, 21, 22, 24, 25, 26 and 27 were SA questions. Items 1, 3, 5, 6, 7, 10, 11, 12, 14, 15, 16, 20, 23 and 28 were social distress questions. The scale initially used "yes" and "no" answers. And higher scores indicated higher levels of SA or distress. Later, researchers tended to use the five - point scale, because the five - point scale had a higher α coefficient of nearly 0.90 than the "yes" and "no" scales. The scoring method was the five - level scoring method.

3.5 Variables

The independent variables of the study was NLE. The dependent variable was CPA. And Intermediate variables were ML, PSS and SA.

3.6 Data Analysis

In this study, IBM Statistical Programme Social Science (SPSS) Version 27.0 was used by researchers to analyze the instrument. And descriptive and inferential analyses were used in the data analysis. Tabachnick et al. (2013) stated that the level of significance was 0.05 for both Pearson Product - Moment Correlation Coefficient in social science research.

The descriptive analysis was used to describe the basic features of the data in a study (Pallant, 2010). And in this study, researchers adopted the descriptive analyses to analyze the demographic factors. The Pearson Correlation Product Moment was used to analyse the relationship of NLE, CPA, ML, PSS and SA.

While, to determine the correlation coefficient, a guideline had to be followed which was a coefficient of -1 indicated two variables were perfectly negatively correlated. Conversely, a coefficient of +1 indicated two variables were perfectly positively correlated. According to Tabachnick et al. (2013), the predictor with the highest simple correlation coefficient was selected first, and the predictor with the highest simple correlation coefficient was selected second. And the predictor that made a significant contribution to the predictive power would be retained and another predictor would be considered (Tabachnick et al., 2013). Some assumptions, such as linearity, normality, needed to be considered before running both tests. In summary, the approach to data analysis in this study was broadly as follows:

(a) In the pre - survey stage, researchers used SPSS 27.0 to analyze the reliability of the scale. In the pre - survey stage, SPSS 27.0 was used to conduct reliability analysis on Adolescent Self - Rating Life Events Checklist (ASLEC), SA Scale (SAS), PSS Scale (PSSS), Mobile Phone Addiction Tendency Scale (MPATS) and Mindful Attention Awareness Scale (MAAS) for college students. After analyzing the internal consistency reliability of each scale, if the Cronbach's α coefficients of each scale and its factors were all above 0.7, the internal consistency reliability of the scale used in this study was good, and the data from the questionnaire and the scale were reliable.

(b) In formal investigation stage, researchers used SPSS 27.0 to analyze common method bias, the reliability and validity, and normality test. SPSS 27.0 was used to conduct Descriptive Statistical Analysis, Pearson Correlation Analysis on the collected data. And Amos 26.0 was used to conduct Structural Equation Modelling on the collected data.

First, the data collection of all variables in this study was carried out using the Questionnaire Star questionnaire survey method, and there might be a common method bias phenomenon. In order to reduce this bias, we made some procedural control measures: firstly, we selected the best existing scales; secondly, we appropriately changed the guidance language of each scale in the design of the questionnaire; thirdly, in the process of testing the research objects, the researcher took the initiative to explain the anonymity and confidentiality of the questionnaire to the research objects, and explained to the research objects that the data was limited to scientific research, so as to control the common method bias sources as much as possible; fourthly, the single - factor test method of Harman was used. Therefore, this study was tested for the presence of common method bias in this study using Harman single - factor test before data analysis. To prevent common method bias in the data, this study conducted a common method bias test on the collected data. The researchers mainly analyzed the data using Harman Single - Factor Method to test the obtained data for common method bias. In other words, the researchers used Harman Single - Factor Method to conduct exploratory factor analysis on all the items in the Adolescent Self - Rating Life Events Checklist (ASLEC), SA Scale (SAS), PSS Scale (PSSS), Mobile Phone Addiction Tendency Scale (MPATS) and Mindful Attention Awareness Scale (MAAS) to determine whether there was a common method bias in the data of this study. Second, reliability and validity tests were conducted for the five main variables measured by the questionnaire. Third, the researcher tested the data for normality. Prior to the data analysis, the data were screened and the data were cleaned, where the data were cleaned using normality tests, Kolmogorov - Smirnov test, Shapiro - Wilk test and Q - Q plots, respectively, in order to check the normality of the data. Fourth, the researchers performed a simple descriptive statistical analysis of demographic variables in the questionnaire. Fifth,

the researchers tested the correlation between the variables in the theoretical model. Finally, Amos software was used to validate the hypothesis model proposed in Chapter 2. This paper responded to the research hypothesis and questions.

(c) Effect model

i. Mediation Effect Model

This model (Wen et al, 2005) was mainly used to analyze how independent variables affected dependent variables. If variable X could affect variable Y through variable M, variable M was called a mediation variable. Among them, M was significantly correlated with X and Y, and the influence of X on Y was strong and stable, and M was after X and before Y. M represented a mechanism in this process, and X affected Y through M. Since mediating effects were indirect effects, they could be analyzed using structural equation models regardless of whether the variable involved latent variables.

In statistical analysis, common mediation effect tests included the stepwise test proposed by Baron and Kenny (First, the independent variable must have significantly affected the dependent variable. Second, the independent variable must have significantly affected the mediating variable. Third, the mediator variable must have significantly affected the dependent variable. Fourth, if the independent variable and the mediating variable entered the equation at the same time, they could still significantly affect the dependent variable and the prediction of the independent variable was weakened, then the mediating variable played a partial mediating role. If the mediating variable became insignificant, the mediating variable played a full mediating role.), Sobel test (In the process of successively testing the coefficients, if at least one was not significant, the Sobel Test could be done.), Structural Equation Model Test and Process Plug - in Bootstrap test.

ii. Mediation Effect Model

This model (Hirschi, 1969; Wen et al., 2005) was mainly used to analyze when independent variables affected dependent variables. If the relationship between variable X and variable Y was affected by variable U, that is, variable U could affect the direction and strength of the relationship between X and Y, variable U was called a moderating variable. The moderating variable U could be qualitative (such as gender, race, type of school, etc.) or quantitative (such as age, blood pressure, etc.). The moderating variable U was mainly used to analyze when X affected Y or when it had a large effect. The moderating variable U could be considered when X had a strong or weak influence on Y. In the moderating effect model, X and U could precede Y and U could precede X. The correlation between U and X and Y could be significant or insignificant. When the correlation between U and X and Y was not significant, the analysis obtained was ideal.

In statistical analysis, the common methods to test the moderating effect of significant variables included Analysis of Variance (All independent and moderator variables were categorical.), Group Regression (Independent variables were continuous variables and moderator variables were categorical variables. According to the value of the moderating variable, the dependent variable was divided into groups, and the regression of the independent variable was done. If the regression coefficient was significantly different, the moderating effect was significant.), Hierarchical Regression Analysis (Independent variables were continuous or categorical variables, and moderator variables were continuous variables).

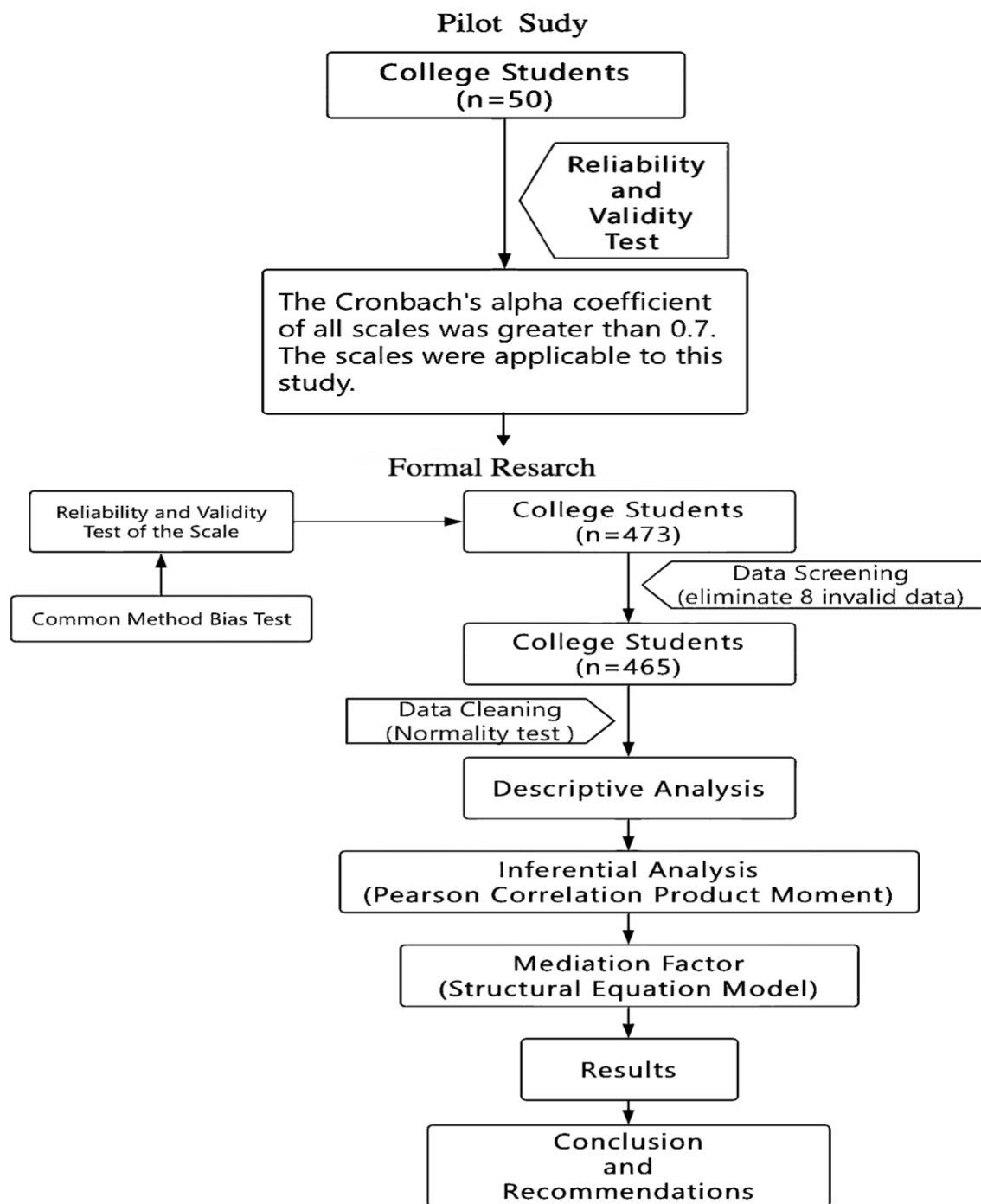


Figure 3.1: Flowchart of Data Analysis

Hierarchical Regression Analysis was performed with the independent and moderator variables standardized or centered. First, the dependent variable was regressed on the independent variable and the moderator variable to obtain the determination coefficient A. Second, the regression of the dependent variable to the independent variable, the moderating variable, and the interaction term between the independent variable and the moderating variable was performed to obtain the measurement coefficient B. If B was significantly higher than A, the moderating effect was significant. Or the Regression Coefficient Test of the interaction term between the independent variable and the moderating variable was done.), Process Plug-in Bootstrap Test and Simple Slope Analysis. The analysis method of latent moderating effect usually adopted the construction of structural equation model, which was suitable for the case that the independent variables were continuous variables and the moderating variables were categorical variables. This method was known as Multi-group Structural Equation Model Testing. The flowchart of data analysis was shown in Figure 3.1.

3.7 Pilot Study

Pilot study was one of the essential and important steps in the field of research. The aim of the pilot study was to investigate problems with the research instrument and the research protocol implemented mainly during the study (Lancaster, 2004). Before conducting a pilot study, the researcher had to estimate the sample size in the pilot study to determine the number of pilot study samples. For this research, about 50 respondents were selected. This sample size was supported by Johanson and Brooks (2009), who stated that a reasonable minimum of 30 respondents was suggested. Zhejiang Guangsha Vocational and Technical University of Construction was selected as the sample for the pilot test. On the premise of seeking the consent of the subjects, the researcher arranged the subjects to fill in

the Questionnaire Star, an online questionnaire survey tool, in an independent room of the school. All the participants needed to do was to scan the Quick response (QR) code of the questionnaire with their mobile phones and fill in the questionnaire and submit it. The researcher informed the subjects about the method of data preservation and kept it strictly confidential. The data were stored on a personal computer and safeguarded by a dedicated staff. The participants could leave on their own after filling out the questionnaire. The collected data were analysed inferentially to get the internal consistency reliability.

Of these, 50 respondents participated in the initial experiment, 25 males and 25 females. The Cronbach alpha coefficients for the five measurement instruments ranged from 0.867 to 0.987. The NLE scale (ASLEC) had a Cronbach alpha, $\alpha = 0.986$. The CPA scale (MPATS) had a Cronbach alpha, $\alpha = 0.947$. The ML scale (MAAS) had a Cronbach alpha, $\alpha = 0.935$. The PSS scale (PSSS) had a Cronbach alpha, $\alpha = 0.867$. The SA scale (SAS) had a Cronbach alpha, $\alpha = 0.987$. All five scales could be used in this study.

3.8 Common Method Bias Test

Firstly, the data collection of all variables in this study was carried out using the Questionnaire Star questionnaire survey method, and there might be a common method bias phenomenon. In order to reduce this bias, we made some procedural control measures: firstly, we selected the best existing scales; secondly, we appropriately changed the guidance language of each scale in the design of the questionnaire; thirdly, in the process of testing the research objects, the researcher took the initiative to make clear the anonymity and confidentiality of the questionnaire to the research participants, and explained to the research objects that the data was limited to scientific research, so as to control the common method bias sources as much as possible; fourthly, the single - factor test method of Harman was

used. Therefore, this study was tested for the presence of common method bias using the Harman single - factor test before data analysis.

In this study, the Questionnaire Star was used to collect data. To prevent the occurrence of common method bias, the collected data were tested for common method bias. The data were mainly analyzed by the Harman single - factor method to test the obtained data for common method bias. That is, exploratory factor analysis was conducted on all the items in the Adolescent Self - Rating Life Events Checklist (ASLEC), SA Scale (SAS), PSS Scale (PSSS), Mobile Phone Addiction Tendency Scale (MPATS) and Mindful Attention Awareness Scale (MAAS) for college students to determine whether there was a common method bias in the data of this study.

Data on NLE, PSS, ML, SA, and CPA were collected using the Questionnaire Star questionnaire. The use of the same measurement method and the characteristics of the project itself might have led to systematic errors in the research results and might have impacted the investigation findings to some degree. Therefore, this research used the Harman single - factor test (Zhou and Long, 2004; Liu and Li, 2017) method before data analysis to conduct factor analysis without rotation for the presence of common method bias in this study. Factor analysis was performed on NLE, PSS, level of mindfulness, SA, and CPA. The analysis results showed that there existed 19 factors whose eigenvalues exceeded 1, and the variance explanation rate of the first factor amounted to 18.445%, which was considerably beneath the critical standard of 40%, and the results were shown as follows. Therefore, there was no notable common method bias in this study. The results were detailed in Table 3.3.

Table 3.3: The Characteristic Root and Variance Contribution Rate of NLE, PSS, ML, SA and CPA of College Students

Factors	Initial Eigenvalue			Extraction Sums of Squared Loadings		
	Characteristic Root	Percentage Variance	Cumulative Contribution	Characteristic Root	Percentage Variance	Cumulative Contribution
		(%)	Rate (%)		(%)	Rate (%)
1	18.076	18.445	18.445	18.076	18.445	18.445
2	8.226	8.394	26.839	8.226	8.394	26.839
3	6.257	6.385	33.223	6.257	6.385	33.223
4	5.326	5.435	38.658	5.326	5.435	38.658
5	3.508	3.580	42.238	3.508	3.580	42.238
6	2.353	2.401	44.639	2.353	2.401	44.639
7	2.008	2.049	46.688	2.008	2.049	46.688
8	1.755	1.790	48.478	1.755	1.790	48.478
9	1.615	1.648	50.126	1.615	1.648	50.126
10	1.499	1.529	51.655	1.499	1.529	51.655
11	1.465	1.495	53.150	1.465	1.495	53.150
12	1.387	1.416	54.565	1.387	1.416	54.565
13	1.257	1.282	55.848	1.257	1.282	55.848
14	1.239	1.264	57.112	1.239	1.264	57.112
15	1.203	1.227	58.339	1.203	1.227	58.339
16	1.124	1.147	59.486	1.124	1.147	59.486
17	1.106	1.128	60.614	1.106	1.128	60.614
18	1.060	1.082	61.696	1.060	1.082	61.696
19	1.033	1.054	62.750	1.033	1.054	62.750
20	1.019	1.040	63.790	1.019	1.040	63.790

3.9 Reliability and Validity Test of The Scale

The reliability and validity test of the scale was an important criterion to judge the quality of the scale. Among them, reliability reflected the consistency and stability of questionnaire measurement, so as to test whether the scale was reliable. While validity

reflected whether a scale could accurately and effectively reflect what it was intended to measure. Validity reflected the degree of agreement between the measured results and the traits to be measured. That is, the higher the degree of coincidence and consistency of the scale, the higher its validity. To sum up, validity referred to the degree to which a scale or test could measure the traits correctly and could reflect the accuracy and validity of the questionnaire. In this study, researchers used SPSS 27.0 to test the reliability and validity of each variable in the questionnaire, so as to test the reliability and validity of the questionnaire.

3.9.1 Reliability Analysis of The Scale

According to Devellis (2011), the values of Cronbach alpha between 0.6 and 0.8 meant good, and the values between 0.8 and 0.9 meant very good. Before the analysis of formal data, the reliability and validity of the scales used were tested as in the pre - survey. That is, researchers needed to verify each scale through confirmatory factor analysis, so that the scale used in this study was more reliable.

Hair et al. (2013) indicated that the Cronbach's alpha of the scale was greater than 0.7, indicating that the reliability of the questionnaire was accepted. The reliability of the scale of each variable adopted in this study was higher than 0.7 (among them, health adaptation, other events, avoidance, anxiety, and mood change were all higher than 0.6, indicating that the reliability test results were good), indicating that the reliability of the questionnaire in this study was high. The results were detailed in Table 3.4.

Table 3.4: Reliability Test of the Questionnaire

Variable	Number of Items	Cronbach's Coefficient
NLE	27	0.927
NLE1	5	0.834
NLE2	5	0.720
NLE3	7	0.774
NLE4	3	0.718
NLE5	4	0.629
NLE6	4	0.652
ML	15	0.882
PSS	12	0.938
PSS1	4	0.817
PSS2	4	0.854
PSS3	4	0.803
SA	28	0.798
SA1	12	0.643
SA2	12	0.652
CPA	16	0.903
CPA1	6	0.791
CPA2	4	0.745
CPA3	3	0.827
CPA4	3	0.616

3.9.2 Validity Analysis of the Scale

In this study, Adolescent Self - Rating Life Events Checklist (ASLEC), SA Scale (SAS), PSS Scale (PSSS), Mobile Phone Addiction Tendency Scale (MPATS) and Mindful Attention Awareness Scale (MAAS) were used to measure the NLE, CPA, ML, PSS and SA. The scales used in this study had been widely used by a large number of researchers to study NLE, CPA, ML, PSS, and SA among Chinese college students. All the scales used in

this study were repeatedly revised and validated by the investigators. At the same time, these scales were all adapted by researchers in China.

It had been shown in literature that when the KOM value was greater than 0.8 and the Bartlett spherical test p was less than 0.001 ($p < 0.001$), the validity test results were very good. When the KOM value was greater than 0.7 and Bartlett's spherical test p was less than 0.001 ($p < 0.001$), the validity test results were good. When the KOM value was greater than 0.6 and Bartlett's spherical test p was less than 0.001 ($p < 0.001$), the validity test results were generally acceptable. All variables in this study met this criterion, indicating that the validity test results were good and could be used for the next step of data analysis. The results were detailed in Table 3.5.

Table 3.5: Validity Test of the Questionnaire

Variable	KOM Value	Bartlett		
		Chi-Square Value (χ^2)	Degree of freedom (df)	p-value
NLE	0.938	5104.553	351	0.000
NLE1	0.836	898.232	10	< 0.001
NLE2	0.775	420.428	10	< 0.001
NLE3	0.791	793.146	21	< 0.001
NLE4	0.653	289.136	3	< 0.001
NLE5	0.711	205.188	6	< 0.001
NLE6	0.716	207.351	6	< 0.001
ML	0.914	2378.632	105	0.000

Table 3.5 continued

PSS	0.925	4052.265	66	0.000
PSS1	0.748	674.148	6	<0.001
PSS2	0.805	899.705	6	<0.001
PSS3	0.782	584.662	6	<0.001
SA	0.940	8249.622	378	0.000
SA1	0.886	2844.884	91	0.000
SA2	0.901	3523.325	91	0.000
CPA	0.909	3209.767	120	0.000
CPA1	0.788	850.906	15	<0.001
CPA2	0.716	433.474	6	<0.001
CPA3	0.670	576.307	3	<0.001
CPA4	0.625	160.807	3	<0.001

3.10 Data Screening

To verify the assumption of normality, the screening of data and data cleaning played a crucial role in inspecting the errors of the data set (Pallant, 2010). Pallant (2010) further claimed that the elimination of inaccurate or irrelevant data was necessary when needed. Hence, data cleaning was a significant procedure for determining whether there were any errors or inconsistencies in the data prior to conducting the statistical analysis. Therefore, before statistical analysis of the data, researchers needed to carefully check the data to prevent inaccurate or irrelevant data.

In this study, a total of 473 participants were included. And a total of 8 data points, 1.69 per cent, were screened out in this thesis. Ultimately, data analysis was conducted only for 465 participants. The key to the screening was significant deviation from the normal category, such as when students filled out the scale, all five variables had the same options, like choosing either A or B. The key to the screening was the significant deviation from the normal category. This was a good indication that the students had not examined the questions carefully and had worked perfunctorily, resulting in vague, inaccurate and difficult to interpret data. This kind of deviation from normal data could not give valid and credible information to support the study. They were screened out to ensure that the results of the study were accurate and valid.

3.11 Data Cleaning

To verify the supposition of normality, scrutinizing the data and data cleaning were highly crucial for detecting faults within the data set. Data cleaning was executed by means of normality testing. The normality of the data was inspected through visual approaches and normality tests such as one - way ANOVA and Kolmogorov - smirnov's normality plot. The relevant analysis was as follows.

Table 3.6: Test of Normality

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
NLE	0.093	465	.000	0.95	465	.000
ML	0.104	465	.000	0.953	465	.000
PSS	0.067	465	.000	0.98	465	.000
SA	0.094	465	.000	0.946	465	.000
CPA	0.056	465	0.001	0.993	465	0.027

a. Lilliefors Significance Correction

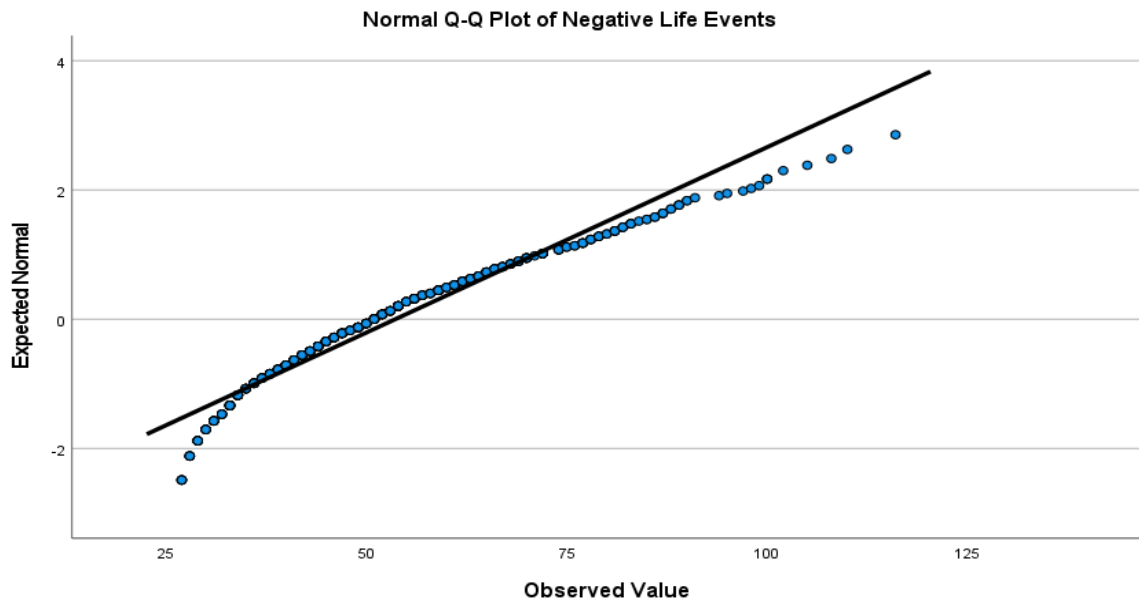


Figure 3.2: Q-Q Plot of NLE

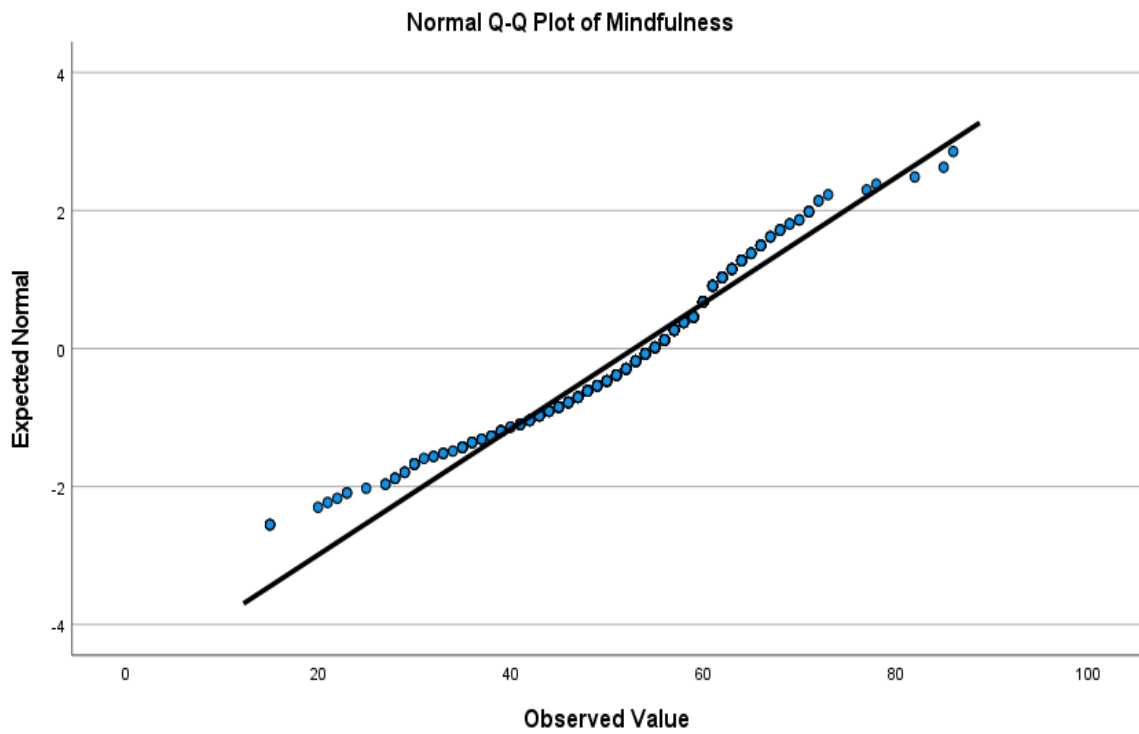


Figure 3.3: Q-Q Plot of ML

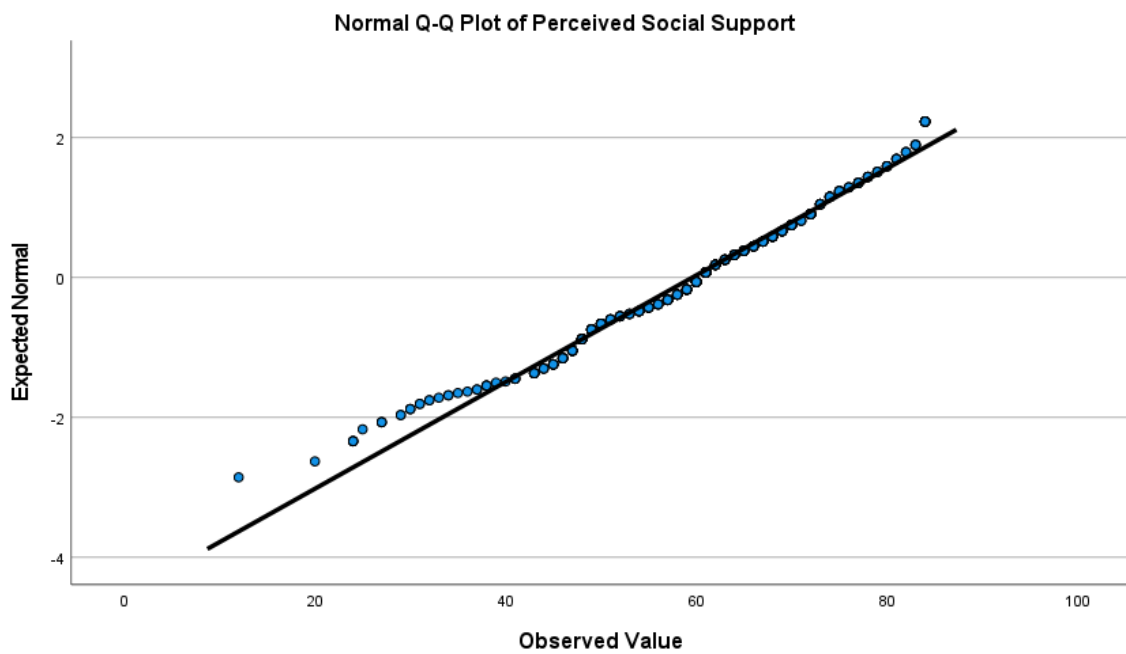


Figure 3.4: Q-Q Plot of PSS

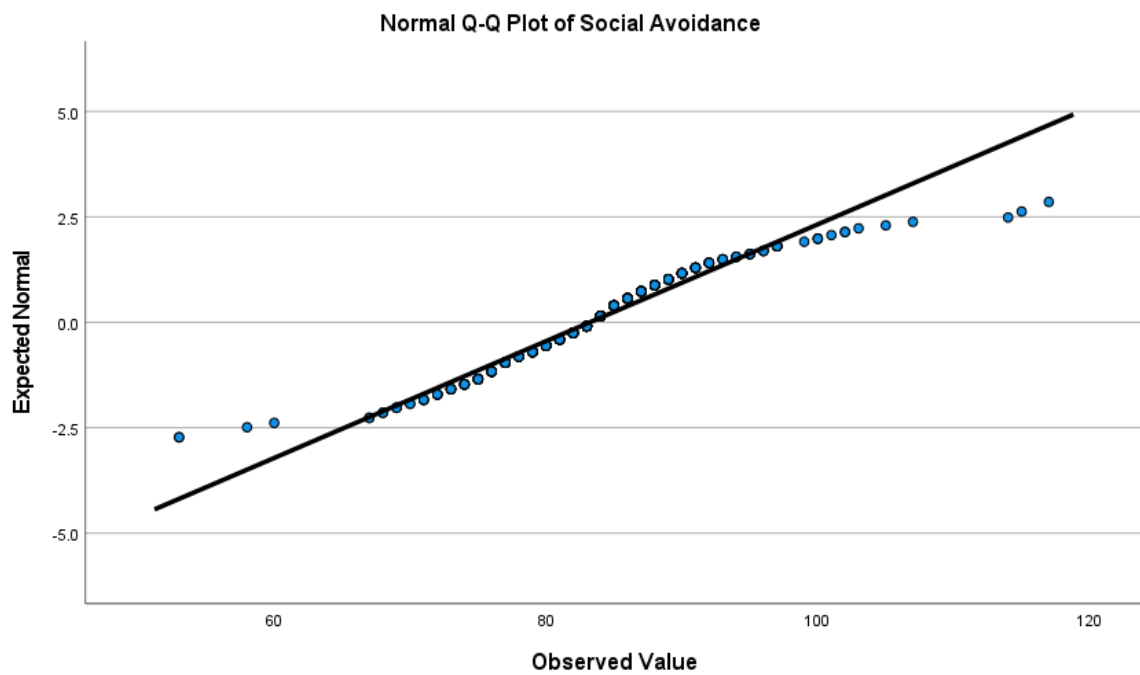


Figure 3.5: Q-Q Plot of SA

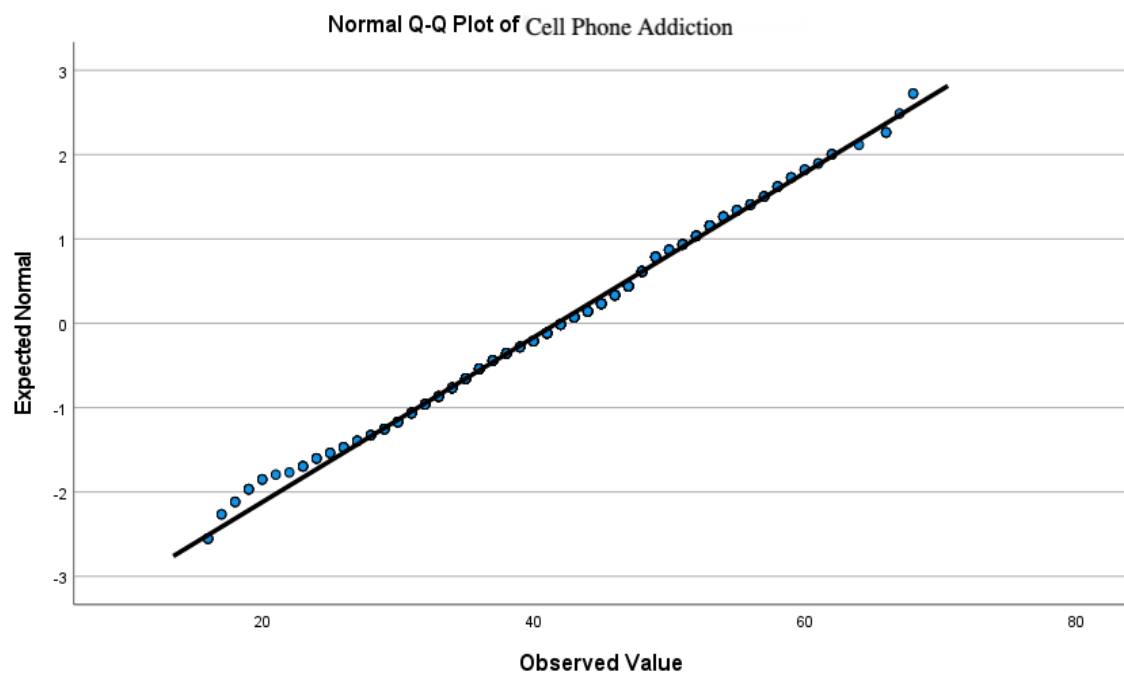


Figure 3.6: Q-Q Plot of CPA

As presented in Table 3.6, the Kolmogorov-Smirnov test for normality test produced result $N(465) = 0.05$, $p = 0.000$ (NLE), $p = 0.000$ (ML), $p = 0.000$ (PSS), $p = 0.000$ (SA), $p = 0.001$ (CPA), supported by a bell-curve histogram and a normal quantile (QQ) plot which confirmed the normality assertion. The histogram uncovered a bell-shaped bend, and the QQ plot evinced a close accordance of observed quantiles with the expected quantiles for a normal distribution. These findings in the aggregate implied that the outcomes of NLE (Presented in the Figure 3.2), ML (Shown in the Figure 3.3), PSS (Shown in the Figure 3.4), SA (Presented in the Figure 3.5) and CPA (Presented in the Figure 3.6) were normally distributed, reinforcing the reliability of parametric statistical analyses utilized for this variable in subsequent analyses.

In summary, the data of the five variables studied in this paper showed a clear normal distribution, which met the requirements for further analysis, and the data could be further analysed in relation to each other.

3.12 Data Collection Procedures

So as to ensure the smooth progress of this study and the quality of the investigation, the researchers carried out strict control over the whole study process, and formulated a unified quality control program for each link of the investigation process. Before the pre-survey, the project team conducted unified training for the testers, so that the testers could clearly understand the purpose and significance of the survey, the overall questionnaire, the key points in the survey, and the stress method in case of problems. And I interviewed 50 respondents to ensure they understood the questions after the pre-experiment and then modify the scale. At the same time, the researchers communicated well with the school

leaders to obtain the support and cooperation of the school, for the purpose of ensuring the orderly and smooth development of the field investigation.

(a) Study Design Stage

i. Scale use: All the scales used in this study had been widely used with high reliability and validity.

ii. Selection and design of Questionnaire Star: In order to fully protect the privacy of the subjects, the online survey tool "Questionnaire Star" was utilized to collect data. To dispel the subjects' concerns, the questionnaire filling page on the mobile phone was automatically shut down after the subjects submitted the questionnaire. In order to avoid repeated questionnaire filling, we set up the questionnaire in advance, that is, one mobile phone could only fill in once, and scanning the Quick Response Code again would show that the questionnaire was invalid.

iii. In order to ensure the smooth progress of the later period, the researcher conducted a strict pre - survey before the formal survey, and timely adjusted and modified the problems in the questionnaire.

(b) Data Collection Stage

i. Scale use: All the scales used in this study had been widely used with high reliability and validity.

ii. Selection and design of Questionnaire Star: In order to fully protect the privacy of the subjects, the online survey tool "Questionnaire Star" was utilized to collect data. To dispel the subjects' concerns, the questionnaire filling page on the mobile phone was automatically shut down after the subjects submitted the questionnaire. In order to avoid

repeated questionnaire filling, we set up the questionnaire in advance, that is, one mobile phone could only fill in once, and scanning the Quick Response Code again would show that the questionnaire was invalid.

iii. In order to ensure the smooth progress of the later period, the researcher conducted a strict pre - survey before the formal survey, and timely adjusted and modified the problems in the questionnaire.

3.13 Research Ethics Principle

In this study, the Research Ethics Principle mainly included the principle of respect for autonomy and the principle of non - harm. As follows:

(a) Respect Principle

The Respect Principle also included three aspects: informed consent, autonomy and privacy protection. Before data collection, the researcher comprehensively introduced the whole research process to the subjects, informed them of the research purpose, significance, precautions and methods of filling in the questionnaire, so as to ensure that the subjects fully understood the whole research process before carrying out the research. After obtaining the verbal consent of the subject, the research could be carried out. All information collected from the subjects was kept strictly confidential in this study, and the collected information was properly stored. The privacy and decisions of the subjects were respected during the study to ensure the right of privacy confidentiality of the subjects.

(b) Non - maleficence Principle

When researchers investigated subjects' NLE and SA level, they should be highly attentive to the possible negative effects when subjects filled out the scale. Therefore, the investigators ought to have kept a close watch on the emotional reactions of the subjects during the investigation. If students were found to be uncomfortable, the questionnaire was stopped in time and emotional counselling was given.

3.14 Chapter Summary

In this study, quantitative methods were used to investigate the relationships among NLE, CPA, ML, PSS and SA. The questionnaire quick - response code was distributed through mobile phones. This chapter mainly discussed the methodology of the research. The research design, population and sampling techniques, sample size, research instrument, variables, data analysis, pilot study, common method bias, reliability and validity, normality, the data - collection procedure, and research ethics were respectively discussed. In the subsequent chapter, the investigator would analyze the results in detail.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Overview

This chapter covered the discussion of descriptive analysis, inferential analysis and mediation effect analysis based on the hypotheses of this research. The main content of this chapter was the data analysis results and conclusion. Firstly, the researcher performed a simple descriptive statistical analysis of the respondent demography. Secondly, the researchers tested the correlation between the variables in the theoretical model. Thirdly, Amos software was used to validate the hypothesis model proposed in Chapter 2. Finally, the researcher analyzed and discussed the correlation between NLE, ML, PSS, SA, and CPA. The parallel mediating factors of ML, PSS, and SA on the relationship between NLE and CPA were analyzed and discussed.

4.2 Descriptive Analysis

In this research, SPSS 27.0 statistical package was utilized for data entry and descriptive statistical analysis. First, the researchers used frequency and percentage to describe the general socio-demographic characteristics of college students. Second, maximum and minimum values were used to describe the scores of NLE, PSS, ML, SA, and CPA. The results of the analysis of respondent demography variables according to the study sample were shown below.

4.2.1 Descriptive Statistical Analysis of Respondent Demography

Table 4.1: Descriptive Information of Respondent Demography (n=465)

Descriptive Information	Categories	Frequency	Percentage (%)
Gender	Male	242	52.0
	Female	223	48.0
Age	18-19	177	38.1
	20-21	176	37.8
	22-23	112	24.1
Grade	Freshman	205	44.1
	Sophomore	142	30.5
	Junior	118	25.4
Major	Science	276	59.4
	Liberal Arts	189	40.6
Only Child	Yes	195	41.9
	No	270	58.1
Student Cadre	Yes	145	31.2
	No	320	68.8
Home Location	Urban	191	41.4
	Non-Urban	274	58.9
Faculty	FAE	94	20.2
	FME	80	17.2
	FIB	84	18.1
	FA	95	20.4
	FI	112	24.1

A total of 465 students were included in this study, including 242 males (52.0%) and 223 females (48.0%). A total of 177 students (38.1%) were aged 18-19 years, 176 students (37.8%) were aged 20-21 years, and 112 students (24.1%) were aged 22-23 years. There were 205 freshmen (44.1%), 142 sophomores (30.5%), and 118 juniors (25.4%) students. There were 276 (59.4%) science students and 189 (40.6%) liberal arts students. There were

195 (41.9%) only children and 270 (58.1%) non-only children. There were 145 (31.2%) student cadres and 320 (68.8%) non-student cadres. There were 191 (41.4%) urban students and 274 (58.9%) non-urban students. There were 94 (20.2 %) students from the Faculty of Architecture and Engineering (FAE), 80 (17.2 %) students from the Faculty of Management and Engineering, 84 (18.1%) students from the Faculty of International Business, 95 (20.4%) students from the Faculty of Art, and 112 (24.1%) students from the Faculty of Information. The results were detailed in Table 4.1.

(**Note: Student cadres** in this study referred to a certain position held by college students during their college years, such as class monitor, class vice monitor, class life committee member, class study committee member, class health committee member, class sports committee member, class deputy secretary and so on. **Non-Student cadres** in this study referred to students who did not hold positions in any class or college, but were merely students).

4.2.2 Descriptive Statistical Analysis of Each Variable

Each dimension of the total NLE were as follows: interpersonal relationship, learning pressure, punishment, loss, health adjustment, and other events. Each dimension of PSS were as follows: family support, friend support, and other support. Each dimension of SA were as follows: avoidance and anxiety. Each dimension of CPA were as follows: withdrawal symptoms, prominent behavior, social comfort, mood change. The minimum-value and maximum-value of the results were detailed in Table 4.2.

Table 4.2: Descriptive Information of Each Variable (n=465)

Variable	n	Minimum-Value (Min)	Maximum-Value (Max)
NLE	465	27	116
NLE1	465	5	25
NLE2	465	5	27
NLE3	465	7	29
NLE4	465	7	29
NLE5	465	4	20
NLE6	465	4	21
ML	465	15	86
PSS	465	12	84
PSS1	465	4	28
PSS2	465	4	28
PSS3	465	4	28
SA	465	53	117
SA1	465	28	58
SA2	465	24	59
CPA	465	16	68
CPA1	465	6	27
CPA2	465	4	18
CPA3	465	3	15
CPA4	465	3	14

4.3 Inferential Analysis based on Research Objectives and Research Hypotheses

Researchers used SPSS 27.0 software to verify the relationship between NLE and CPA, NLE and ML, NLE and PSS, NLE and SA, ML and CPA, PSS and CPA, SA and CPA. A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between NLE, PSS, ML, SA and CPA.

4.3.1 Relationship between NLE and CPA

Ho1: NLE is not significance related to CPA among college students.

A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between NLE and CPA.

Firstly, all dimensions of NLE were positively related with the total score of NLE (0.747-0.868), showing high relationship. There was also a significant positive relationship between the dimensions of NLE (0.506-0.748), and the relationship between other events and loss was low. While other events have higher relationship with being punished.

Table 4.3: Relationship between NLE and CPA

	NLE	NLE1	NLE2	NLE3	NLE4	NLE5	NLE6	CPA	CPA1	CPA2	CPA3	CPA4
NLE	1											
NLE1	.868**	1										
NLE2	.842**	.689**	1									
NLE3	.844**	.664**	.643**	1								
NLE4	.747**	.535**	.576**	.578**	1							
NLE5	.813**	.654**	.665**	.588**	.546**	1						
NLE6	.798**	.653**	.544**	.748**	.506**	.571**	1					
CPA	.266**	.268**	.192**	.171**	.193**	.235**	.266**	1				
CPA1	.243**	.256**	.185**	.150**	.176**	.203**	.235**	.924**	1			
CPA2	.244**	.225**	.176**	.164**	.210**	.212**	.240**	.859**	.767**	1		
CPA3	.174**	.173**	.111*	.109*	.113*	.171**	.180**	.743**	.581**	.499**	1	
CPA4	.238**	.247**	.166**	.169**	.149**	.228**	.215**	.807**	.676**	.657**	.453**	1

(Note: *p< 0.05; **p< 0.01; ***p< 0.001.)

Secondly, all dimensions of CPA were positively related with the total score of CPA (0.743-0.924), showing high relationship. There was also a significant positive relationship between the dimensions of CPA (0.453-0.767).

Finally, the overall score of NLE was markedly positively related with the cumulative score of CPA (0.266), the dimensions of NLE were conspicuously positively relationship with the total score of CPA (0.171-0.268), and the entire score of NLE was strikingly positively relationship with the sum score of CPA (0.174-0.244).

Hence, the null hypothesis was rejected.

4.3.2 Relationship between NLE and ML

Ho2: NLE is not significance related to ML among college students.

A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between NLE and ML.

Table 4.4: Relationship between NLE and ML

	NLE	NLE1	NLE2	NLE3	NLE4	NLE5	NLE6	ML
NLE	1							
NLE1	.868**	1						
NLE2	.842**	.689**	1					
NLE3	.844**	.664**	.643**	1				
NLE4	.747**	.535**	.576**	.578**	1			
NLE5	.813**	.654**	.665**	.588**	.546**	1		
NLE6	.798**	.653**	.544**	.748**	.506**	.571**	1	
ML	.329**	.268**	.243**	.290**	.236**	.299**	.300**	1

(Note: *p< 0.05; **p< 0.01; ***p< 0.001.)

Firstly, all dimensions of NLE were positively related with the total score of NLE (0.747-0.868), showing high relationship. There was also a significant positive relationship between the dimensions of NLE (0.506-0.748), and the relationship between other events and loss was low. While other events had higher relationship with being punished.

Secondly, the sum score of NLE was obviously positively related with the aggregate score of ML (0.329), and the dimensions of NLE were strikingly positively relationship with the overall score of ML (0.236-0.300).

Hence, the null hypothesis was rejected.

4.3.3 Relationship between NLE and PSS

Ho3: NLE is not significance related to PSS among college students.

A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between NLE and PSS.

First of all, the dimensions of NLE were eminently positively related with the sum score of NLE (0.747-0.868), showing high relationship. There was also a significant positive relationship between the dimensions of NLE (0.506-0.748), among which other life events were less related with loss. However, other events had higher relationship with punishment.

Secondly, all dimensions of PSS were positively related with the total score of PSS (0.948-0.958), which showed high relationship. There was also a significant positive relationship between the dimensions of PSS (0.851-0.875), indicating high relationship.

Finally, the entire score of NLE was obviously negatively related with the cumulative score of PSS (-0.293), the aggregate score of each dimension of NLE was conspicuously negatively relationship with the overall score of PSS (-0.129~-0.308), the total score of NLE was markedly negatively relationship with the sum score of each dimension of PSS (-0.276~-0.283).

Hence, the null hypothesis was rejected.

Table 4.5: Relationship between NLE and PSS

	NLE	NLE	NLE	NLE	NLE	NLE	NLE	PSS	PSS	PSS	PS
NL	1										
NL	.868*	1									
NL	.842*	.689*	1								
NL	.844*	.664*	.643*	1							
NL	.747*	.535*	.576*	.578*	1						
NL	.813*	.654*	.665*	.588*	.546*	1					
NL	.798*	.653*	.544*	.748*	.506*	.571*	1				
PSS	-	-	-	-	-	-	-	1			
PSS	-	-	-	-	-	-	-	.958	1		
PSS	-	-	-	-	-	-	-	.953	.875	1	
PSS	-	-	-	-	-	-	-	.948	.863	.851	1

(Note: *p< 0.05; **p< 0.01; ***p< 0.001.)

4.3.4 Relationship between NLE and SA

Ho4: NLE is not significance related to SA among college students.

A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between NLE and SA.

First of all, the aspects of NLE were obviously positively related with the sum score of NLE (0.747-0.868), showing high relationship. There was also a significant positive relationship between the dimensions of NLE (0.506-0.748), among which other life events were less relationship with loss. Other events were more likely to be associated with punishment.

Secondly, all dimensions of SA were positively related with the total score of SA (0.878-0.879), showing high relationship. There was also a significant positive relationship between the dimensions of SA (0.543).

Finally, the aggregate score of NLE was eminently positively related with the sum score of SA (0.108). All dimensions of NLE (except learning pressure and punishment) were significantly positively relationship with the total score of SA (0.104-0.111). The gross score of NLE was positively relationship with the avoidance dimension of SA (0.111).

Hence, the null hypothesis was rejected.

Table 4.6: Relationship between NLE and SA

	NLE	NLE1	NLE2	NLE3	NLE4	NLE5	NLE6	SA	SA1	SA2
NLE	1									
NLE1	.868**	1								
NLE2	.842**	.689**	1							
NLE3	.844**	.664**	.643**	1						
NLE4	.747**	.535**	.576**	.578**	1					
NLE5	.813**	.654**	.665**	.588**	.546**	1				
NLE6	.798**	.653**	.544**	.748**	.506**	.571**	1			
SA	.108*	.109*	0.046	0.085	0.111*	.104*	.104*	1		
SA1	.111*	.098*	0.068	0.085	0.111*	.101*	.114*	.879**	1	
SA2	0.08	.094*	0.013	0.064	0.084	0.082	0.068	.878**	.543**	1

(Note: *p< 0.05; **p< 0.01; ***p< 0.001.)

4.3.5 Relationship between ML and CPA

Ho5: ML is not significance related to CPA among college students.

A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between ML and CPA.

Firstly, each dimension of CPA has a significant positive relationship with the total score of CPA (0.743-0.924), indicating high relationship. There was also a significant positive relationship between the dimensions of CPA (0.453-0.767).

Secondly, the gross score of CPA was conspicuously positively relationship with the level of mindfulness (0.411), and the dimensions of CPA were significantly positively relationship with the level of mindfulness (0.269-0.422).

Hence, the null hypothesis was rejected.

Table 4.7: Relationship between ML and CPA

	ML	CPA	CPA1	CPA2	CPA3	CPA4
ML	1					
CPA	.411**	1				
CPA1	.354**	.924**	1			
CPA2	.422**	.859**	.767**	1		
CPA3	.269**	.743**	.581**	.499**	1	
CPA4	.382**	.807**	.676**	.657**	.453**	1

(Note: *p< 0.05; **p< 0.01; ***p< 0.001.)

4.3.6 Relationship between PSS and CPA

Ho6: PSS is not significance related to CPA among college students.

A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between PSS and CPA.

Table 4.8: Relationship between ML and CPA

	PSS	PSS1	PSS2	PSS3	CPA	CPA1	CPA2	CPA3	CPA4
PSS	1								
PSS1	.958**	1							
PSS2	.953**	.875**	1						
PSS3	.948**	.863**	.851**	1					
CPA	-.178**	-.167**	-.186**	-.155**	1				
CPA1	-.114*	-.107*	-.122**	-.096*	.924**	1			
CPA2	-.156**	-.133**	-.166**	-.147**	.859**	.767**	1		
CPA3	-.190**	-.193**	-.204**	-.146**	.743**	.581**	.499**	1	
CPA4	-.158**	-.144**	-.156**	-.150**	.807**	.676**	.657**	.453**	1

(Note: *p< 0.05; **p< 0.01; ***p< 0.001.)

Firstly, all dimensions of PSS were significantly positively relationship with the total score of PSS (0.948-0.958), indicating high relationship. There was also a significant positive relationship between the dimensions of PSS (0.851-0.875).

Secondly, all dimensions of CPA were significantly positively relationship with the total score of CPA (0.743-0.924), indicating high relationship. There was also a significant positive relationship between the dimensions of CPA (0.453-0.767).

Finally, there was a significant negative relationship between the total score of PSS and the total score of CPA (-0.178), a significant negative relationship between the total score of PSS and the dimensions of CPA (-0.114~ -0.190), and a significant negative relationship between the dimensions of PSS and the total score of CPA (-0.155~ -0.186).

Hence, the null hypothesis was rejected.

4.3.7 Relationship between SA and CPA

Ho7: SA is not significance related to CPA among college students.

A Pearson Product-Moment Correlation Coefficient was used to examine the correlation between SA and CPA.

Firstly, all dimensions of SA were significantly positively related with the total score of SA (0.878-0.879), indicating high relationship. There was also a significant positive relationship between the dimensions of SA (0.543).

Table 4.9: Relationship between SA and CPA

	SA	SA1	SA2	CPA	CPA1	CPA2	CPA3	CPA4
SA	1							
SA1	.879**	1						
SA2	.878**	.543**	1					
CPA	.175**	.139**	.169**	1				
CPA1	.154**	.137**	.134**	.924**	1			
CPA2	.173**	.117*	.188**	.859**	.767**	1		
CPA3	.152**	.125**	.143**	.743**	.581**	.499**	1	
CPA4	.141**	.116*	.132**	.807**	.676**	.657**	.453**	1

(Note: *p< 0.05; **p< 0.01; ***p< 0.001.)

Secondly, all dimensions of CPA were significantly positively relationship with the total score of CPA (0.743-0.924), indicating high relationship. There was also a significant positive relationship between the dimensions of CPA (0.453-0.767).

Finally, the cumulative score of SA was obviously positively relationship with the gross score of CPA (0.175), the overall score of SA was strikingly positively relationship with the dimensions of CPA (0.141-0.173), and the dimensions of SA was markedly positively relationship with the sum score of CPA (0.139-0.169).

Hence, the null hypothesis was rejected.

In summary, there was a significant relationship among all variables, which provided a prerequisite and basis for further testing the mediating role of ML, PSS and SA in NLE and CPA.

4.4 Mediation Factor

Amos 26.0 software was used to validate the hypothesis model proposed in Chapter 2. The relationship between the variables had been verified above. The results of data analysis showed that there was a significant relationship between any two of the above study variables. However, the significant relationship between the variables was the prerequisite for the mediation test, which conformed to the premise of the analysis of the mediation effect in statistics, and could be applied to test the mediation effect of NLE and CPA.

The multiple mediation model included chain and parallel multiple mediation. The chain multiple mediation model referred to the mutual relationship between multiple mediation variables, showed sequential characteristics and forming a mediation chain (Liu & Ling, 2009; Fang, Wen, Zhang, & Sun, 2014). A parallel multiple mediation model meant

that there was no mutual relationship between multiple mediating variables. Some scholars (Bastian, Denson, & Haslam, 2013) showed that compared with the traditional sequential regression test, Bootstrap could better test multiple mediators, and the test power and accuracy were higher. In this study, 2,000 Bootstrap repeated sampling was used to test the mediation effect.

4.4.1 The Mediating Factor of ML on NLE and CPA

Ho8: ML is not mediate of NLE on CPA among college students.

Based on the hypothesis model, this study constructed a structural equation model with NLE as the independent variable, ML as the mediating variable, and CPA as the dependent variable. Amos 26.0 was used to test the structural equation model, and the fitting index of the full model was obtained as follows: $\chi^2/df= 3.398$ ($\chi^2/df<5$), GFI= 0.947 (GFI>0.9), AGFI= 0.916 (AGFI>0.9), NFI= 0.949 (NFI>0.9), CFI= 0.963 (CFI>0.9), RMSEA= 0.072 (RMSEA<0.08), the above data met the value standard of the fitting index. It showed that the fitting degree between the model and the data was within the acceptable range, which indicated that the model in the structural equation model fit well. For further details, please referred to Table 4.10 and Figure 4.1.

Table 4.10: The Main Model Fitting Index of the Model

χ^2/df	GFI	AGFI	NFI	CFI	RMSEA
3.398	0.947	0.916	0.949	0.963	0.072

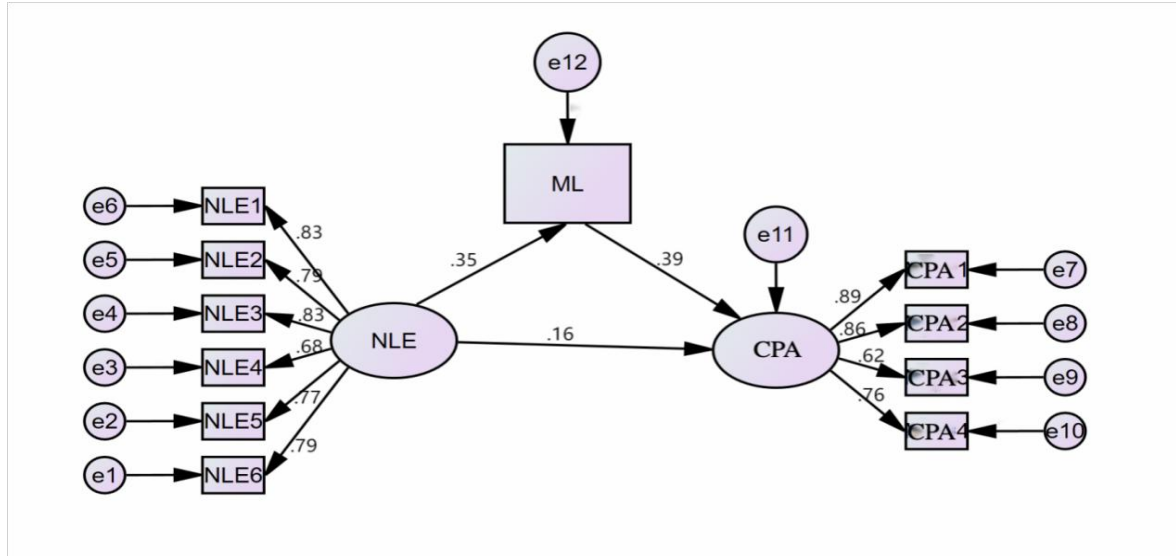


Figure 4.1: Analysis of the Mediating Factor of ML on NLE and CPA

The path coefficient analysis was shown as follows: NLE had a significant positive impact on ML ($\beta = 0.347$, $p < 0.001$), ML had a significant positive impact on CPA ($\beta = 0.390$, $p < 0.001$), and NLE had a significant positive impact on CPA ($\beta = 0.162$, $p < 0.05$). The details were as follows.

Table 4.11: Test Results of the Main Path Parameters of the Model

	Path		Estimate	S.E.	C.R.	P-Value
NLE	--->	ML	0.347	0.215	7.278	***
NLE	--->	CPA	0.162	0.078	3.247	0.001
ML	--->	CPA	0.390	0.016	8.149	***

In order to further examine the mediating factor of ML, the researchers adopted Bootstrap self-sampling method to construct a 95% confidence interval of the mediating effect. The outcomes demonstrated that the direct effect size generated by NLE to CPA was 0.162, and its 95% CI was (0.057, 0.265), which did not include 0 in the confidence interval. Therefore, the direct prediction effect of NLE on CPA was significant. Among them, the

indirect effect of NLE on CPA through ML is 0.135, the confidence interval was (0.079, 0.195), and 95% CI did not contain 0 value, indicated that the intermediary effect was significant and the effect size was 45.45%. Since the direct effect of NLE on CPA was significant, ML exerted a significant influence on partially mediating the relationship between NLE and CPA. Hence, the null hypothesis was rejected.

Table 4.12: Bootstrapping Analysis of the Significance of Simple Mediation Effects

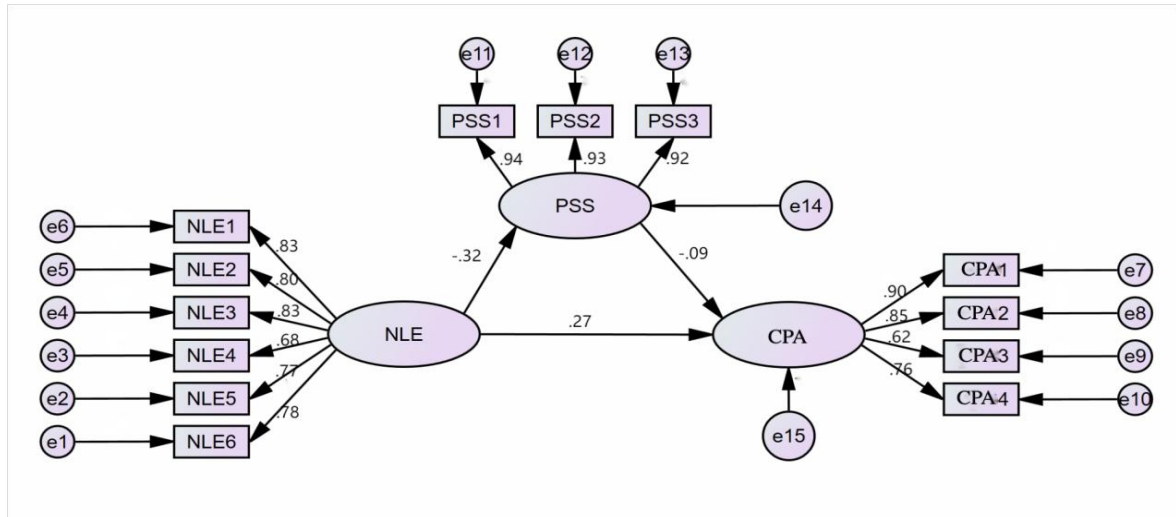
Parameter	Estimate	Confidence Interval (95%)		P-Value	Effect size
		Lower	Upper		
Indirect Effect	0.135	0.079	0.195	0.001	45.45%
Direct Effect	0.162	0.057	0.265	0.001	-
Total Effect	0.297	0.198	0.393	0.001	-

4.4.2 The Mediating Factor of PSS on NLE and CPA

Based on the hypothesis model, this study constructed a structural equation model with NLE as the independent variable, PSS as the mediating variable, and CPA as the dependent variable. Amos 26.0 was used to test the structural equation model, and the fitting index of the full model was obtained as follows: $\chi^2/df= 2.859$ ($\chi^2/df < 5$), GFI= 0.945 (GFI> 0.9), AGFI= 0.919 (AGFI> 0.9), NFI= 0.957 (NFI> 0.9), CFI= 0.972 (CFI>0.9), RMSEA= 0.063 (RMSEA< 0.08), the above data met the value standard of the fitting index. It showed that the fitting degree between the model and the data was within the acceptable range, which indicated that the model in the structural equation model fit well. For further details, please referred to Table 4.13 and Figure 4.2.

Table 4.13: The Main Model Fitting Index of the Model

χ^2/df	GFI	AGFI	NFI	CFI	RMSEA
2.859	0.945	0.919	0.957	0.972	0.063

**Figure 4.2:** Analysis of the Mediating Factor of PSS on NLE and CPA

The path coefficient analysis was as follows: NLE had a significant negative impact on PSS, PSS had a insignificant negative impact on CPA, and NLE had a significant positive impact on CPA. The details were as follows.

Table 4.14: Test Results of the Main Path Parameters of the Model

Path	Estimate	S.E.	C.R.	P-Value
NLE ---> PSS	-0.317	0.090	-6.430	***
NLE ---> CPA	0.269	0.084	5.022	***
PSS ---> CPA	-0.086	0.044	-1.683	0.092

In order to further test the mediating factor of PSS, the researcher adopted Bootstrap self-sampling method to construct a 95% confidence interval of the mediating effect. The consequences revealed that the direct effect value generated by NLE to CPA was 0.269, and the 95% CI was (0.166, 0.373), which did not include 0 in the confidence interval. Therefore, NLE had a significant direct predictive effect on CPA. Among them, the indirect effect of NLE on CPA through PSS was 0.027, the confidence interval was (-0.009, 0.066), and 95% CI contained 0 value, indicated that the mediating factor was not significant. Therefore, PSS had no significant mediating factor between NLE and CPA. Hence, the null hypothesis was failed to reject.

Table 4.15: Bootstrapping Analysis of the Significance of Simple Mediation Effects

Parameter	Estimate	Confidence interval (95%)		P	Effect size
		Lower	Upper		
Indirect Effect	0.027	-0.009	0.066	0.129	-
Direct Effect	0.269	0.166	0.373	0.001	-
Total Effect	0.296	0.197	0.392	0.001	-

4.4.3 The Mediating Factor of SA on NLE and CPA

Ho10: SA is not mediate of NLE on CPA among college students.

Based on the hypothesis model, this study constructed a structural equation model with NLE as the independent variable, SA as the mediating variable, and CPA as the dependent variable. Amos 26.0 was used to test the structural equation model, and the fitting index of the full model was obtained as follows: $\chi^2/df= 2.831$ ($\chi^2/df < 5$), GFI= 0.952 (GFI> 0.9), AGFI= 0.926 (AGFI> 0.9), NFI= 0.950 (NFI> 0.9), CFI= 0.967 (CFI> 0.9), RMSEA= 0.063 (RMSEA< 0.08), the above data met the value standard of the fitting index. It showed

that the fitting degree between the model and the data was within the acceptable range, which indicated that the model in the structural equation model fit well. For further details, please referred to Table 4.16 and Figure 4.3.

Table 4.16: The Main Model Fitting Index of the Model

χ^2/df	GFI	AGFI	NFI	CFI	RMSEA
2.831	0.952	0.926	0.950	0.967	0.063

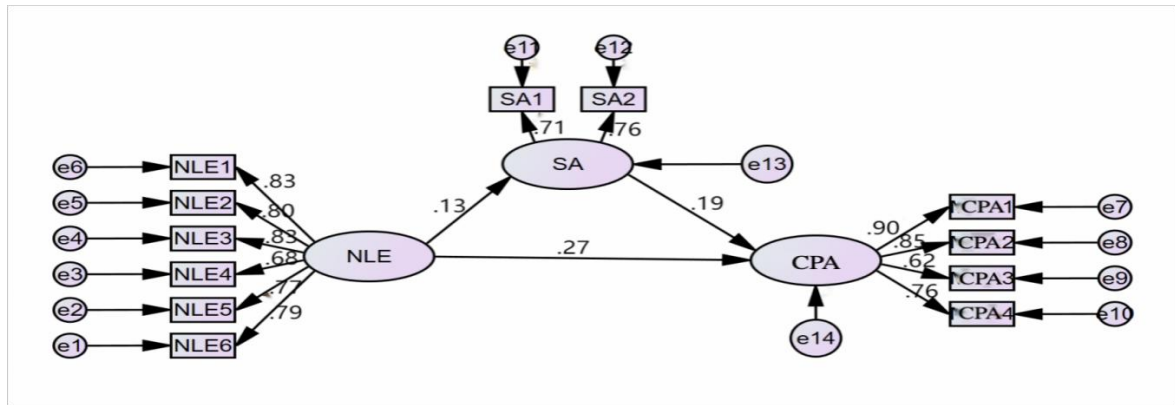


Figure 4.3: Analysis of the mediating factor of SA on NLE and CPA

The path coefficient analysis was as follows: NLE had a significant positive impact on SA ($\beta = 0.135$, $p < 0.05$), SA had a significant positive impact on CPA ($\beta = 0.189$, $p < 0.05$), and NLE had a significant positive impact on CPA ($\beta = 0.270$, $p < 0.001$). The details were as follows.

Table 4.17: Test Results of the Main Path Parameters of the Model

Path			Estimate	S.E.	C.R.	P-Value
NLE	--->	SA	0.135	0.074	2.196	0.028
SA	--->	CPA	0.189	0.079	3.112	0.002
NLE	--->	CPA	0.270	0.080	5.322	***

In order to further test the mediating effect of SA, the researcher adopted Bootstrap self-sampling method to construct a 95% confidence interval of the mediating effect. The findings indicated that the direct effect value generated by NLE to CPA was 0.270, and the 95% CI was (0.165, 0.365), which did not include 0 in the confidence interval. Therefore, NLE had a significant direct predictive effect on CPA. Among them, the indirect effect of NLE on CPA through SA was 0.025, the confidence interval was (0.003, 0.081), and 95% CI did not contain 0 value, indicated that the intermediary effect was significant and the effect size was 8.45%. Since the direct effect of NLE on CPA was significant, SA played a significant partial mediating role between NLE and CPA. Hence, the null hypothesis was rejected.

Table 4.18: Bootstrapping Analysis of the Significance of Simple Mediation Effects

Parameter	Estimate	Confidence Interval (95%)		p-value	Effect Size
		Lower	Upper		
Indirect Effect	0.025	0.003	0.081	0.023	8.45%
Direct Effect	0.270	0.165	0.365	0.001	-
Total Effect	0.296	0.197	0.391	0.001	-

4.4.4 The Mediating Factors of ML, PSS, and SA

Based on the hypothesis model, this study constructed a structural equation model with multiple mediating effects, took NLE as independent variables, ML, PSS and SA as mediating variables, and CPA as dependent variable. Amos 26.0 was used to test the structural equation model, and the full model fitting index obtained was as follows: $\chi^2/df=2.577$ ($\chi^2/df < 5$), GFI= 0.938 (GFI> 0.9), AGFI= 0.914 (AGFI> 0.9), NFI= 0.944 (NFI> 0.9), CFI= 0.965 (CFI> 0.9), RMSEA= 0.058 (RMSEA< 0.08), the above data met the value standard of the fitting index. It showed that the fitting degree between the model and the data was within the acceptable range, which indicated that the model in the structural equation model fit well. For further details, please referred to Table 4.19 and Figure 4.4.

Table 4.19: The Main Model Fitting Index of the Model

χ^2/df	GFI	AGFI	NFI	CFI	RMSEA
2.577	0.938	0.914	0.944	0.965	0.058

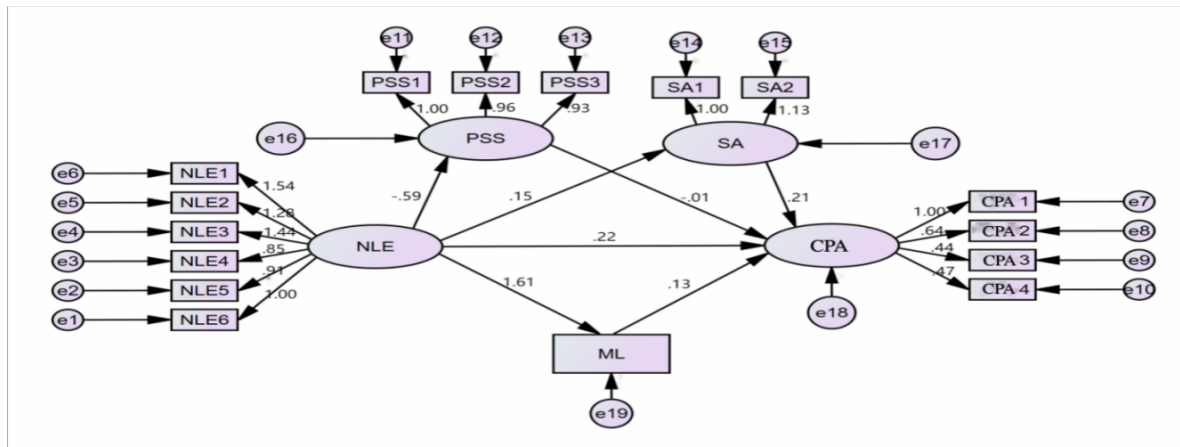


Figure 4.4: Analysis of Mediating Factors of ML, PSS, and SA

The path coefficient analysis was shown as follows: NLE showed a significant negative effect on PSS, NLE had a significant positive effect on SA, NLE had a significant positive effect on ML, NLE had a significant positive effect on CPA, PSS had no significant effect on CPA, SA had a significant positive effect on CPA, and ML had a significant positive effect on CPA. The details were shown in Table 4.20 and Figure 4.5.

Table 4.20: Test Results of the Main Path Parameters of the Model

	Path		Estimate	S.E.	C.R.	<i>p</i> -value
NLE	--->	PSS	-0.324	0.09	-6.587	***
NLE	--->	SA	0.131	0.073	2.101	0.036
NLE	--->	ML	0.355	0.215	7.46	***
NLE	--->	CPA	0.143	0.082	2.692	0.007
PSS	--->	CPA	-0.016	0.041	-0.342	0.732
SA	--->	CPA	0.158	0.073	2.832	0.005
ML	--->	CPA	0.375	0.016	7.848	***

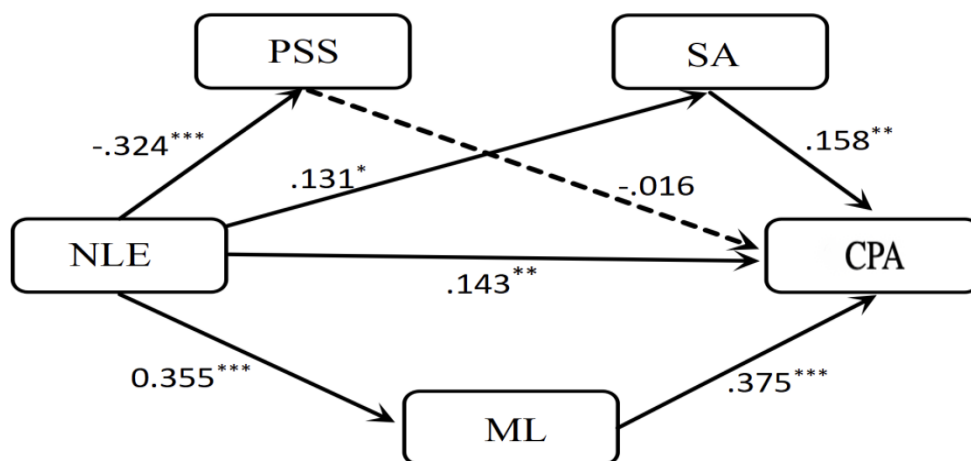


Figure 4.5: Test Results of the Main Path Parameters of the Model

Table 4.21: Bootstrapping Analysis of the Significance of Multiple Mediation Effects

Parameter	Estimate	Confidence Interval		<i>p</i> -value	Effect Size
		(95%)			
		Lower	Upper		
sind1	0.021	0.002	0.072	0.028	6.95%
sind2	0.133	0.077	0.193	0.001	44.04%
sind3	0.005	-0.031	0.039	0.749	1.66%
Total Indirect Effect	0.159	0.088	0.237	0.001	52.65%
Direct Effect	0.143	0.035	0.249	0.010	-
Total Effect	0.302	0.201	0.399	0.001	-

Note: Sind1: NLE→ SA→ CPA; Sind2: NLE→ ML→ CPA; Sind3: NLE→ PSS→ CPA; Direct Effect: NLE→ CPA.

In order to further test the mediating factors of ML, SA and PSS, the researchers used Bootstrap sampling method to construct the 95% confidence interval of the mediating effect. The outcomes demonstrated that the direct effect size of NLE to CPA was 0.159, and its 95% CI was (0.088, 0.237). Therefore, NLE had a significant direct predictive effect on CPA. Among them, the indirect effect of NLE on CPA through SA was 0.021, the confidence interval was (0.002, 0.072), and the 95% CI did not include 0 value, indicating that the mediating factor was significant, and the effect size was 6.95%. The indirect effect of NLE through ML on CPA was 0.133, the confidence interval was (0.077, 0.193), and the 95% CI did not include 0 value, indicating that the mediating effect was significant, and the effect size was 44.04%. The indirect effect of NLE through PSS on CPA was 0.005, and the confidence interval was (-0.031, 0.039). This 95% CI included 0 value, indicating that the indirect effect of NLE→ PSS→ CPA was not significant. The total indirect effect was

significant: The effect size was 52.65%, within the 95% confidence interval (0.088, 0.237), which did not include 0. Because the direct effect of NLE on CPA was significant, SA and ML were partially mediating effects. Therefore, SA and mindfulness played a significant parallel mediating role between NLE and CPA. However, PSS had no notable mediating factor between NLE and CPA.

4.5 Discussion

During the discussion, the researcher focused particularly on the correlations among the five variables (NLE, CPA, ML, PSS and SA), as well as the roles of the five variables in the structural equation model.

4.5.1 Relationship between NLE, CPA, ML, PSS, and SA

4.5.1.1 Relationship between NLE and CPA

Ho1: NLE was not significance related to CPA among college students.

The conclusions of this study indicated that the aggregate score of NLE was significantly positively related to the whole score of CPA, the dimensions of NLE had a significant positive association with the full score of CPA, and the complete score of NLE was significantly positively correlated with the dimensions of CPA. That is, the NLE of college students had a significant positive prediction effect on CPA. The results of this study were inconsistent with the research hypothesis. Moreover, the results of this study were consistent with those of Zhou et al. (2022). Hence, the null hypothesis was rejected.

The results of this study showed that the more NLE college students suffered in interpersonal relationship, learning pressure, punishment, loss factor, health adaptation and other aspects, the more likely they were to have more CPA and behavior, which was

consistent with the results of previous studies (Pu et al., 2023). On the one hand, college students faced various problems in daily life, including a series of NLE that college students suffered in social interaction, educational burden, punishment, loss factor, health adaptation and other aspects, and felt less social support subjectively. The psychological needs of pursuing success and realizing self - value could not be met. It brought great pressure to college students. Some studies had shown that stress was one of the risk factors leading to CPA (Chiu, 2014). When college students could not properly deal with the major frustration and pressure they faced, they might use mobile phones to relieve pressure (Hea - Young et al., 2017). On the other hand, when college students encountered NLE, it further encouraged them to relieve stress through various ways, such as escaping, seeking social connections and recreational activities. The anonymity, de - inhibition and excitability of the mobile phone network could help them achieve these goals (Luo et al., 2017). In addition, the theory of limited self - control held that when an individual faced an external stressor, he or she would consume psychological resources to face the pressure, which would wear down the individual's limited self - control ability. The deficiency of self - control would induce many non - adaptive behaviors or addictions (Xia et al., 2020). The above reasons further made college students bear more and more pressure when facing NLE, which made the motivation of using handheld mobile devices stronger, and then bad behaviors such as losing control of mobile phone use appeared.

4.5.1.2 Relationship between NLE and ML

Ho2: NLE was not significance related to ML among college students.

The findings of this study indicated that the total score of NLE was significantly positively in correspondence with the whole score of ML, and each dimension of NLE was significantly positively in connection with the full score of ML, that is, the NLE of college

students had a significant positive predictive effect on the level of mindfulness. The results of this study were inconsistent with some previous studies (Teng et al., 2017). So far, there had been very few studies on the correlation between NLE and ML. For the time being, there were no studies on the correlation between NLE and the level of mindfulness. A scholar (Teng et al., 2017) investigated 2,792 freshmen in a medical college in Guangzhou with a correlation scale to investigate the role of mindfulness in NLE, dejection, poor sleep quality and other negative states of college students. The research findings indicated that the level of mindfulness was negatively correlated with NLE. Mindfulness and sleep quality showed a chain mediation relationship between NLE and depressive mood, and the model was well fitted. However, Teng et al. (2017) also showed in the discussion group that life events had little impact on mindfulness, that is, mindfulness was a relatively stable quality of individuals, and the level of mindfulness existed as a protective factor in the proven path. However, the mechanism by which mindfulness acted on this pathway was not clear. Existing studies had confirmed that the core of mindfulness mechanism was attention (Peng & Ju, 2013), so mindfulness might act on negative states by affecting attention, but the mechanism of attention acting between mindfulness and multiple negative states was not clear. Peng and Ju (2013) pointed out that the change of attention was the core mechanism of mindfulness, that is, the level of mindfulness contributed to the change of people's thinking mode and helped individuals shift from "action thinking mode" to "existential thinking mode", which was not motivated by a specific goal. There was no need to constantly test and evaluate "how to achieve the goal". The focus of existential thinking mode was to "perceive" and "accept" the current facts without giving judgment, but to center on the current experience, which regarded the negative experience originally related to the self as the object existence, and no longer brought too much subjective evaluation and emotion.

This study's results manifested that the total score of NLE was significantly positively related to the complete score of ML, and each dimension of NLE showed a significantly positive relation to the entire score of ML, that is, the NLE of college students had a significant positive predictive effect on the level of mindfulness, which might be closely related to the psychological defense mechanism of self - acceptance. Studies had shown (Tan, 2004) that when individuals encountered NLE, they would have a variety of conflicts in their hearts and further produce negative emotions, which would seriously affect the normal psychological function of individuals and cause harm to their mental health. In order to avoid further psychological damage caused by negative emotions to us, in the subconscious of individuals, people would naturally use a certain defense mechanism to quell individual inner conflicts, which was the self - protection tendency of individuals to restore emotional balance and stability. When college students encountered NLE, their subconscious would naturally use self - acceptance as a defense mechanism to protect themselves from secondary harm. The core of mindfulness was to be aware of and accept the present without judging what had happened (Peng & Ju, 2013), which was exactly in line with Li's (2002) definition of the concept of self - acceptance. This was why the more NLE college students faced, the higher the level of individual mindfulness. Hence, the null hypothesis was rejected.

4.5.1.3 Relationship between NLE and PSS

Ho3: NLE was not significance related to PSS among college students.

The results of this study showed that the total score of NLE of academy students exhibited a significant negative connection with the full score of PSS, the dimensions of NLE showed a significant adverse relation to the complete score of PSS, and the total score of NLE showed a significant unfavorable relation to the dimensions of PSS, that is, NLE

encountered by college students could significantly negatively predict PSS. The results of this study were inconsistent with the hypothesis. Hence, the null hypothesis was rejected.

The results of this study showed that the higher the degree of NLE experienced by college students, the lower their level of PSS, which was consistent with the results of previous studies (Huang et al., 2021). The results of this study showed that there was a correlation between stress factors such as NLE and PSS, and the common NLE of college students included interpersonal relationship, learning pressure, health adaptation and other problems. Studies had shown that interpersonal problems would cause individuals to be in a long - term chronic stress state, resulting in anxiety and other adverse emotions (Shan et al., 2017), and they could not cope well with stressful events. When college students experienced more NLE, they would enter a state of stress, and thus felt less social support, so they also had a higher level of social anxiety. When college students were less affected by NLE, they could open themselves more socially, communicate more smoothly with others, perceive more societal backing, and experience less social phobia. In conclusion, undergraduates who were greatly affected by NLE could reduce their experience of social anxiety by improving their level of PSS. Meanwhile, in the process of stress, PSS was an important positive psychological resource for an individual, which could improve the individual's coping ability and reduce the stress response, so as to buffer the adverse impact of life events (Wei & Zhang, 2021). In the face of NLE, individuals would have anxiety and other adverse reactions, and these adverse emotions would further affect the relationship between individuals and family, society, friends, colleagues, and people with different relationships gave individuals different support, understanding, and help, which could effectively help individuals face NLE and learn better after gaining understanding. In addition, the social support system would further make the individual feel the warmth and care of the society,

and actively cope with NLE. In addition, Wolfradt, Hempel, and Miles (2003) showed that the higher the level of PSS, the higher the positive coping style when facing trepidation and other unfavourable emotions (Wolfradt et al., 2003). There were also relevant research results that NLE would negatively influence the level of individual subjective well - being, but good social support could help alleviate the negative impact of NLE on subjective well - being. In other words, NLE would accelerate the occurrence of negative emotions, and the social support system could help buffer the negative effects of NLE on negative emotions, and help individuals adjust their negative cognition of NLE, thus improving their positive emotions (Gao, 2017).

4.5.1.4 Relationship between NLE and SA

Ho4: NLE was not significance related to SA among college students.

The results of this study showed that the total score of NLE was markedly and positively linked to the aggregate score of SA, the total score of each dimension of NLE was conspicuously and positively associated with the overall score of SA, and the total score of NLE was favorably correlated with the avoidance dimension of SA, that is, the NLE of college students had a significant positive predictive effect on SA and distress. The results of this study were inconsistent with the research hypothesis and the results of this study were consistent with the previous research results (Gao et al., 2020). Hence, the null hypothesis was rejected.

The results of this study showed that the more NLE college students suffered in interpersonal relationship, loss factors, health adaptation and other aspects, the more likely they were to have SA behavior and distress in interpersonal communication. Relevant studies had shown (Gao et al., 2020) that there was a positive linkage between NLE and sense of

deficiency, SA and distress in college students, that is, the more NLE experienced by college students, the more internal deficiency, and the more prone to social evasion and distress. Some related researches had demonstrated (Li et al., 2020) that when college students were faced with NLE, they would perceive more trauma than others through social comparison, bringing about a feeling of relative deprivation, which would have an important impact on individual social behavior, such as withdrawal behaviors (such as social isolation) and reduced - achievement behaviors. The accumulation of negative emotions in social activities and the reduction of social interaction might lead to more SA and distress. In addition, some scholars (Zhong et al., 2019) divided 136 college students into experimental group, placebo group and control group for intervention research, and used relevant scales to evaluate the variables before and after intervention. The research results showed that the scores of social anxiety, shyness, and SA and distress within the experimental group subsequent to training were notably lower than those prior to training, while there was no significant change in the placebo group and the control group before and after training. That is, the interpersonal relationship group training course could effectively reduce the social anxiety of college students, improve the degree of SA and distress, and shyness of college students in interpersonal communication. However, interpersonal communication problems were widespread among adolescents and were one of the main NLE troubling college students (Wei et al., 2013). The greater the interpersonal communication problems, the more social anxiety, SA and distress of college students would be.

4.5.1.5 Relationship between ML and CPA

Ho5: ML was not significance related to CPA among college students.

The outcomes of this study revealed that the level of mindfulness displayed a significant positive correlation with the total score of CPA, and the level of mindfulness was

significantly positively correlated with all dimensions of CPA, that is, the level of mindfulness could significantly positively predict CPA. The results of this study were similar to some previous studies (Min, 2019), which might be related to the mindfulness attention bias. Studies had shown (Ma, 2023) that college students with mobile phone addiction would pay more attention to mobile phone - related pictures for a longer time, which would lead to more obvious attention bias in college students, and it was easier for college students to have mobile phone addiction behaviors. Attention bias (Ma, 2023) was a highly sensitive and selective way of attention to specific stimuli, which was the basis for the maintenance and reinforcement of addictive behaviors, and was also one of the characteristics of substance use and abuse. A large number of studies (Min, 2019) had shown that college students with mobile phone addiction would have attention detachment difficulty in responding to mobile phone - related stimuli. Individuals with higher levels of CPA tended to have unconscious attention preference for relevant cues, which was accompanied by attention detachment difficulty. This unconscious attention preference and attention withdrawal difficulty could lead to severe mobile phone addiction (Peng et al., 2023). Hence, the null hypothesis was rejected.

Of course, there were also a large number of studies showing a significant negative correlation between the level of mindfulness and the total score of CPA (Fan et al., 2023). The research results of Fan et al. (2023) showed that mindfulness was capable of not merely directly predicting college students' smartphone addiction, but also indirectly predicting university students' smartphone addiction through the mediating role of depression. So far, there had been very few studies on the level of mindfulness and CPA, and almost all of them focused on the influence of mindfulness training on CPA (Haschke et al., 2018), and there were few studies on mindfulness as the mediating variable (Liu et al., 2018). In this study,

the level of mindfulness could significantly positively predict CPA, which might be related to the attention bias of college students. Some studies had shown (Peng & Ju, 2013) that the core of mindfulness lay in personal attention. Individuals with high levels of mindfulness were more willing to "perceive" and "accept" the facts of the moment, and did not judge what was happening at the moment, took the current experience as the center, and did not give too much subjective evaluation and emotion to the events happening at the moment. The research results of Tan (2004) showed that when an individual encountered NLE, various conflicts would occur in the individual's heart, which would further lead to adverse emotions, which would seriously affect the normal psychological function of the individual and cause harm to the mental health of the individual. However, in order to avoid the negative emotions from harming our psychology and physiology again, individuals would instinctively use the defense mechanism conducive to physical and mental health to quell the inner conflict of individuals. Therefore, when college students encountered NLE, in order to prevent NLE from causing secondary damage to the body, college students would instinctively accept NLE without judging them, resist and process the current events, and no longer bring too much subjective evaluation and emotion, so as to further promote the level of individual mindfulness. Studies had shown (Peng et al., 2023) that a high level of mindfulness might cause an individual to focus more on the use of various mobile phone software and be immersed in the present state. Such unconscious attention preference and attention detachment difficulties would lead to serious mobile phone addiction, which would further lead to college students' dependence on mobile phones. In addition, according to the CPA reinforcement theory (Wang, 2015), individuals could obtain positive effects when using mobile phones, which brought great convenience to individuals. At the same time, the versatility of mobile phones could meet the different needs of individuals and bring certain

psychological pleasure to college students to a certain extent, thus encouraging new mobile phone use behaviors in order to obtain more positive reinforcement. In this cycle, individuals gradually became dependent on mobile phone use behaviors.

4.5.1.6 Relationship between PSS and CPA

Ho6: PSS was not significance related to CPA among college students.

The results of this study showed that the total score of PSS had a significant inverse correlation with the total score of CPA, the cumulative score of PSS was significantly negatively in relation to each dimension of CPA, and the total score of each dimension of PSS was significantly negatively correlated with the total score of CPA. The results of this study were inconsistent with the research hypothesis. Hence, the null hypothesis is rejected.

The results of this study show that the PSS of college students has a significant negative predictive effect on CPA, that is, the more PSS college students receive, the less dependence they will suffer on CPA and other related problems, and the better it is for college students to deal with bad behaviors of CPA, which is in accordance with the outcomes of previous studies (Davis, 2001). Studies (Wang & Zhang, 2015) have shown that CPA is closely related to negative emotions among university students. CPA may show more negative emotions, less life satisfaction, less positive emotions, less subjective well-being and less PSS. Davis (2001) showed that the lack of social support system is one of the causes of pathological Internet use. When college students are unable to establish an effective social support system, they may seek external support and links through the media to eliminate the resulting negative emotional experience such as loneliness. Further, it can lead to college students' excessive addiction to mobile phones (Davis, 2001). At the same time, Associated studies have revealed that PSS has a significant negative correlation with relative

deprivation. When facing NLE, college students will perceive more trauma than others through social comparison, resulting in a sense of relative deprivation. Individuals with a strong sense of deprivation are more likely to play games and socialize through mobile phone networks, seeking comfort in the virtual world to vent bad emotions, reduce inner pain, and escape injustice in reality (Li et al., 2020).

4.5.1.7 Relationship between SA and CPA

Ho7: SA was not significance related to CPA among college students.

The results showed that the total score of SA was markedly positively linked with the overall score of CPA, the total score of SA was significantly positively correlated with the dimensions of CPA, and the aggregate score of dimensions of SA was conspicuously and positively associated with the total score of CPA, that is, SA and distress had a significant positive predictive effect on CPA behavior of college students. Hence, the null hypothesis was rejected.

The results of this study were inconsistent with the research null hypothesis, and the results of this study were consistent with previous studies (Wu et al., 2019). In this study, SA and distress were the manifestations of social anxiety. Some studies had shown that mobile phone addicts had more social anxiety and interpersonal communication problems (Chen et al., 2016). Social anxiety strikingly predicted the tendency of mobile device addiction, and individuals with excessive anxiety in social interaction might be more willing to use mobile phones as a substitute for face - to - face situations. If an individual's anxiety was not controlled, it would further lead the individual to spend more time on the mobile phone (Wang & Wu, 2014), and the long - term use of mobile phones to meet the individual's social interaction would easily lead to the individual's CPA.

4.5.2 The Mediating Effects of ML, PSS and SA on NLE and CPA

4.5.2.1 Analysis of the Mediating Effect of ML between NLE and CPA

Ho8: ML was not mediate of NLE on CPA among college students.

The correlation analysis results of this study showed that NLE, ML and CPA were significantly positively interrelated with each other. The greater the number of NLE, the higher the level of mindfulness and the more severe the degree of CPA. The mediation model constructed in this study suggested that the level of mindfulness exerted a mediating effect between NLE and phone dependence, which was not in line with the null hypothesis of this study. Hence, the null hypothesis was rejected.

NLE, as the fuse of CPA, would cause individuals to have a series of physical and psychological problems such as bad emotions. Therefore, when there were more and heavier NLE, it was easy to cause individuals to have CPA behaviors (Pu et al., 2023). Some studies had shown (Peng & Ju, 2013) that mindfulness might influence attention to negative states and help individuals to "perceive" and "accept" the current facts. Instead of giving judgment, mindfulness focused on the current experience. It didn't bring too much subjective evaluation and emotion. According to Tan et al. (2004), when individuals encountered NLE, they would have a variety of conflicts in their hearts and further produce negative emotions, which would seriously affect the normal psychological function of individuals and cause harm to their mental health. In order to avoid the psychological damage caused by negative emotions to us again, they would instinctively use defense mechanisms that were beneficial to physical and mental health to quell the inner conflicts of individuals. Therefore, when an individual encountered a negative life event, in order to prevent the negative life event from causing secondary damage to the body, the individual would instinctively accept the negative life

event without judging it. The individual would take the current experience as the center and treat the original self-related negative experience as the object to exist and recognize, and would not bring too much subjective evaluation and emotion. This further led to increased levels of individual mindfulness. Studies had shown (Peng et al., 2023) that a high level of individual mindfulness might lead to an individual being more focused on the use of various mobile phone software, which made it difficult for college students to pay attention to cell-phone-related stimuli and produced unconscious attention preference for relevant cues in mobile phones. This unconscious attention preference and attention detachment difficulty would further affect college students' dependence on mobile phones. In addition, according to the CPA reinforcement theory (Wang, 2015), individuals could obtain positive effects when using mobile phones, which brought great convenience to individuals.

At the same time, the versatility of mobile phones could meet the different needs of individuals and brought certain psychological pleasure to university undergraduates to a certain extent, thus encouraging new mobile phone use behaviors in order to obtain more positive reinforcement. In this cycle, individuals gradually became dependent on mobile phone use behaviors. Therefore, in the present research, the level of mindfulness of college students might affect the CPA behavior of college students by affecting individual attention, but the specific mechanism of attention between mindfulness, NLE and CPA was not clear for the time being, and future studies could continue to explore it.

4.5.2.2 Analysis of the Mediating Effect of PSS between NLE and CPA

Ho9: PSS was not mediate of NLE on CPA among college students.

The results of correlation analysis showed that NLE, PSS and CPA were significantly correlated with each other. The mediation model constructed in this study showed that the

mediating effect of PSS between NLE and CPA was not significant, which was consistent with the research null hypothesis. The results of this study were consistent with the results of previous studies (Zhou et al., 2022), that is, the results of this study indicated that NLE of college students could not alleviate the degree of college students' CPA through the level of college students' PSS. Hence, the null hypothesis was failed to be rejected.

On one hand, this study did not distinguish between social support and PSS, which might have been one of the reasons for the non - significant mediating effect. Future research could try to distinguish the effects of social support and PSS on the relationship between NLE and CPA, and further investigate the relationship between the two kinds of social assistance and CPA. Social support (Ma et al., 2022) referred to the resources that individuals obtained from social activities, including material and spiritual help provided by family and friends, generally including objective support and subjective support. PSS (Guo et al., 2023) was the social support that individuals could perceive and comprehend subjectively, which was a subjective feeling. Social support put more emphasis on material and emotional support, while PSS put more emphasis on perceived support. In this study, the mediating effect of PSS between NLE and CPA was not significant.

On the other hand, it might also have been associated with less subjective PSS among college students. When college students suffered from NLE, they would feel less social support, and it would bring great pressure to college students when the psychological needs of pursuing success and realizing self - worth were not met. Studies had shown that stress was one of the risk factors for mobile phone addiction (Chiu, 2014). When college students were unable to properly deal with the greater frustration and pressure they faced, they might use mobile phones to seek to release pressure (Hea - Young et al., 2017). At the same time,

college students would further relieve pressure through various ways, such as escape, seeking social connection and recreational activities, and the anonymity, disinhibition and excitability of mobile phone networks could help them achieve these goals (Luo et al., 2017). In addition, the theory of limited self - control held that individuals would consume psychological resources to face pressure when facing external tension stimuli, which would consume their limited self - control ability and reduce their PSS, and the deficiency of self - control would induce many maladaptive behaviors or addictions (Xia et al., 2020).

4.5.2.3 Analysis of the Mediating Effect of SA on NLE and CPA

Ho10: SA was not mediate of NLE on CPA among college students.

The pertinent analytical outcomes of this research indicated that SA, NLE and CPA were significantly positively correlated with each other, and the more NLE, the stronger SA and the more serious CPA. The mediation model constructed in this research showed that SA exerted a mediating function between NLE and CPA, which was unconsonant with the null hypothesis of this study. Hence, the null hypothesis was rejected.

Along with the advancement and swift evolution of science and technology, every student had at least one smart phone. And the incorrect use of mobile phones further led to college students having a certain dependence on mobile phones. Nowadays, college students' dependence on mobile phones was changing more and more seriously with time. The diversity of mobile phone functions had enriched college students' study and spare - time life, and also made them more and more inseparable from mobile phones. Secondly, college students were in the critical period of individual development of social and emotional needs. Due to various factors, college students' needs could not be met or were at a low level, which would easily lead to a series of problems such as anxiety (Durham et al., 2025). Relevant

studies (Li et al., 2020) had shown that when faced with NLE, college students would perceive more trauma than others through social comparison, giving rise to a feeling of relative deprivation, which would have an important impact on individual social behaviors, such as withdrawal behaviors (such as social isolation, etc.) and reduced achievement behaviors. The accumulation of negative emotions in social activities and the reduction of social interaction might lead to more SA and distress. Studies had shown that mobile phone addicts had more social anxiety and interpersonal communication problems (Chen et al., 2016), and social anxiety markedly foretold the tendency of mobile phone addiction. Individuals who were excessively anxious in social situations might be more willing to use mobile phones as a substitute for face - to - face situations and get in touch with others through phone calls, short messages and the Internet to reduce their inner anxiety. If an individual's inner anxiety was not controlled, it would further cause the individual to spend more time on the mobile phone (Wang & Wu, 2014), and the long - term use of mobile phones to satisfy their social interactions was likely to lead to CPA.

In this study, SA and distress mediated NLE and CPA among college students. In other words, when college students encountered NLE, the greater the learning pressure, the failure of interpersonal communication and the more NLE, the more NLE would lead to a significant increase in individual negative sentiments (for instance social unease), and the failure to improve social anxiety would further lead to inadequate personal security. Researches had demonstrated (Wu et al., 2019) that societal apprehensiveness intermediated the connection between mobile phone addicts' sense of security and CPA. Individuals with a low sense of security were more likely to shift their attention to the virtual network and further seek social support and peer relationship in the network, which further weakened their social interaction in real life. However, the accumulation of negative emotions in social

activities, the increase of insecurity and the decrease of social interaction might further lead to more SA and distress among college students. In the process of social interaction, college students with SA and social anxiety might be more willing to use mobile phones as substitutes to get in touch with others through phone calls, short messages and the Internet to relieve their inner anxiety. If the inner anxiety of individuals was not controlled, it would further lead to individuals spending more time on mobile phones, and long - term use of mobile phones to satisfy their social interactions was easy to strengthen the individual's CPA behavior. In addition, the anonymity and versatility of the mobile phone network could just avoid face - to - face communication and interaction between individuals and others. Individuals relied on multi - functional mobile phones to meet their hindered psychological needs. Long - term use and reinforcement of mobile phones further led to individual dependence on mobile phones. Therefore, in this study, SA increased dependence and frequency of cellphone use so as to relieve inner discomfort through excessive negative emotions, insecurity and reduction of individual social interaction when individuals encountered NLE.

4.5.2.4 Analysis of the Mediating Effects of ML, PSS and SA on NLE and CPA

In this study, ML, PSS and SA were used as mediating variables, NLE was employed as an independent variable, and CPA was adopted as a dependent variable to establish a parallel mediation model. The results of this study indicated that the level of mindfulness and SA played a parallel mediating role between NLE and CPA. In other words, NLE could play a role in the CPA of college students through two mediating variables, the level of mindfulness and SA.

The more NLE college students encountered, the higher probability they had to shift their attention to the virtual network and further seek for peer relationship in the network, which further weakened the individual's social interaction in real life. However, the accumulation of negative emotions in social activities, the increase of insecurity and the decrease of social interaction might further lead to more social shunning and tribulation among college students. In the process of social interaction, college students with social evasion and social trepidation might be more willing to use mobile phones as substitutes to get in touch with others through phone calls, short messages and the Internet to relieve their inner anxiety. If the inner anxiety of individuals was not controlled, it would further lead to individuals spending more time on mobile phones, and long - term use of mobile phones to satisfy their social interactions was easy to strengthen the individual's CPA behavior.

At the same time, when college students encountered more NLE, in order to prevent NLE from causing secondary damage to the body, college students would instinctively accept NLE without judging them, resist and process current events, and no longer bring too much subjective evaluation and emotions, thus further promoting the level of individual mindfulness. Studies had shown (Peng et al., 2023) that a high level of mindfulness might cause an individual to bestow greater heed upon the use of various mobile phone software and be immersed in the present state. Such unconscious attention preference and attention detachment difficulties would lead to serious mobile phone addiction, which would further lead to college students' dependence on mobile phones.

Therefore, the two parallel mediation models established in this study, $NLE \rightarrow ML \rightarrow CPA$ and $NLE \rightarrow SA \rightarrow CPA$, were verified under Amos modeling. NLE could not only directly affect CPA, but also affect CPA through ML and SA.

Table 4.22: The Summary of Findings

No.	Research Objective	Research Hypothesis	Findings	Types of Analysis
1	To determine the relationship between NLE and CPA among college students.	Ho1: NLE was not significance related to CPA among college students.	Rejected	Pearson Correlation Product Moment
2	To determine the relationship between NLE and ML among college students.	Ho2: NLE was not significance related to ML among college students.	Rejected	Pearson Correlation Product Moment
3	To determine the relationship between NLE and PSS among college students.	Ho3: NLE was not significance related to PSS among college students.	Rejected	Pearson Correlation Product Moment
4	To determine the relationship between NLE and SA among college students.	Ho4: NLE was not significance related to SA among college students.	Rejected	Pearson Correlation Product Moment
5	To determine the relationship between ML and CPA among college students.	Ho5: ML was not significance related to CPA among college students.	Rejected	Pearson Correlation Product Moment
6	To determine the relationship between PSS and CPA among college students.	Ho6: PSS was not significance related to CPA among college students.	Rejected	Pearson Correlation Product Moment
7	To determine the relationship between SA and CPA among college students.	Ho7: SA was not significance related to CPA among college students.	Rejected	Pearson Correlation Product Moment

Table 4.22: continued

8	To determine the ML as mediator for NLE on CPA among college students.	Ho8: ML was not mediate of NLE on CPA among college students.	Rejected	Structural Equation Model
9	To determine the PSS as mediator for NLE on CPA among college students.	Ho9: PSS was not mediate of NLE on CPA among college students.	Fail to reject	Structural Equation Model
10	To determine the SA as mediator for NLE on CPA among college students.	Ho10: SA was not mediate of NLE on CPA among college students.	Rejected	Structural Equation Model

4.6 Chapter Summary

This chapter covered the descriptive analysis, correlation analysis, mediation effect analysis and discussion.

Firstly, *SPSS 27.0* statistical package was adopted for data entry and descriptive statistical analysis.

Secondly, A Pearson Product-Moment Correlation Coefficient was used to examine the relationship between NLE, PSS, ML, SA and CPA. There was a significant relationship among all variables, which provided a prerequisite and basis for further testing the mediating role of ML, PSS and SA in NLE and CPA.

Thirdly, Amos 26.0 software was used to validate the hypothesis model proposed in Chapter 2. SA and ML played a significant parallel mediating role between NLE and CPA. However, PSS had no marked mediating effect between NLE and CPA.

Finally, in this chapter, the researcher analyzed and discussed the correlation between NLE, ML, PSS, SA, and CPA. The parallel mediating factors of ML, PSS, and SA on the relationship between NLE and CPA were analyzed and discussed.

The conclusion and recommendations of this study were written in the next chapter.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Overview

This chapter covered the conclusion, implications, recommendations for future studies, and a summary of the research.

5.2 Conclusion

- (1) NLE was positively related with CPA.
- (2) NLE was positively related with SA and ML.
- (3) NLE was negatively related with PSS.
- (4) SA and ML were positively related with CPA.
- (5) PSS was negatively related with CPA.
- (6) ML function as a mediating constituent in the influence of NLE on CPA.
- (7) SA function as a mediating constituent in the influence of NLE on CPA.
- (8) ML and SA function as a mediating constituent in the influence of NLE on CPA.

All in all, NLE could directly predict CPA in a positive way. After introducing ML, PSS and SA into the analytical model, it was found that NLE had a side-by-side effect through ML and SA, and further affected CPA.

5.3 Implication

The significance of this study could be expounded from two facets.

From the theoretical facet, the research outcomes facilitated the augmentation of the theory. Theoretically expounded, this study broadened the influence of NLE on CPA from a plain issue to a matter of mediating effects, encompassing ML, PSS and SA.

From the practical significance perspective, the research results demonstrated that ML and SA had significant mediating roles in the effect of NLE on CPA. This discovery was conducive for school administrators in overseeing, governing and practicing with respect to students' CPA phenomenon.

5.4 Research Recommendations

This study explored the influence of college students' NLE on CPA, and introduced ML, PSS and SA as mediating variables to build a three - path model and conduct an empirical study. However, due to the limitation of inquiry, this study still had many limitations.

5.4.1 Sample Representativeness

Due to the limitation of time, region and other conditions, this study only sampled undergraduate students in Dongyang City, Zhejiang Province. The representativeness of the sample taken by the researchers in this study was limited, which only represented the relationship between ML, PSS and SA of college students in Dongyang City in NLE and CPA. The results of the study were easy to lead to regional differences, which affected the validity of the study to a certain extent.

5.4.2 Research Methods

This study adopted a horizontal comparison study, but did not compare the performance of the same object at different time nodes, and lacked a dynamic tracking investigation of the research object. In the future, cases and longitudinal follow - up studies could be appropriately added to make the research results more rich, complete, thorough and in - depth.

5.4.3 Research Content

In this study, ML was selected as the mediating variable for research, and the relationships between NLE and ML, and ML and CPA were discussed . At present, the academic research on this aspect was still limited, and there were still different opinions on the relationship between ML and CPA. This study had enriched the content in this aspect and could provide reference for subsequent research, but a large number of samples were still needed to discuss the relationship between the two. In addition, this study selected PSS as the mediating variable for research, and explored the relationships among PSS, NLE and CPA. The research results of this path were consistent with the null research hypothesis, so there was a need to enlarge the sample size in the future, and further distinguish the two concepts of social support and perceptive social support, which could be improved in subsequent studies.

5.5 Summary of Research

In this chapter, it covered the conclusion, implications, research deficiencies and prospects, recommendations to future studies and the summary of the research.

REFERENCES

- An, J., Zhang, J., Cao, S., Lin, H., & Han, Y. (2020). Study on effective intervention of peer group psychological counseling on CPA of college students. *Psychologies Magazine*(01), 02.
- Ary, D., Jacobs, L.C., & Sorensen, C. (2010). *Introduction to research in education*, 8th ed., California: Wadsworth.
- Baer, R. A. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(01), 27-45.
- Ball-Rokeach, S. J., & Defleur, M. L. (1976). A dependency model of mass media effects. *Communication Research*, 03(01), 3-21.
- Baltzell, A., & Summers, J. (2017). *The Power of Mindfulness*, Switzerland: Springer Nature.
- Bastian, B., Denson, T. F., & Haslam, N.(2013). *Bootstrapping test of mediation effects of moral outrage and dehumanization on the relationship between crime harmfulness and severity of punishment using Preacher and Hayes (2008) syntax in Study 3*.
[online] Available at: https://xueshu.baidu.com/usercenter/paper/show?paperid=5006362ec6e47c5755e951c9aaa1fc00&site=xueshu_se.
- Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *Cyberpsychology and behavior*, 08(01), 39-51.
- Bickham, D., Hswen, Y., & Rich, M. (2015). Media use and depression: Exposure, household rules, and symptoms among young adolescents in the USA. *International Journal of Public Health*, 60.

- Billieux, J. (2012). Problematic use of the mobile phone: A literature review and a pathways model. *Current Psychiatry Reviews*, 08(04).
- Billieux, J., Linden, M. V. d., & Rochat, L. (2010). The role of impulsivity in actual and problematic use of the mobile phone. *Applied Cognitive Psychology*, 22(09), 1195-1210.
- Bishop, S. R., Lau, M. A., Shapiro, S., Carlson, L., Car-Mody, J., & Zindel, V. S. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology Science and Practice*, 09(03), 76-80.
- Brand, A. H., & Johnson, J. H. (1982). Note on reliability of the life events checklist. *Psychological Reports*, 50(3c), 1274-1274.
- Brand, M., Wegmann, E., Stark, R., Mueller, A., Woelfling, K., Robbins, T. W., & Potenza, M. N. (2019). The interaction of person-affect-cognition-execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience and Biobehavioral Reviews*, 104, 01-10.
- Brantley, & Kabat-Zinn, J. (2007). *Calming your anxious mind - how mindfulness and compassion can free you from anxiety, fear*. New Harbinger Publications.
- Brown, G. W., Sklair, F., Harris, T. O., & Birley, J. L. T. (1973). Life-events and psychiatric disorders. Some methodological issues. *Psychological Medicine*, 03(01).
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(04), 822-848.

- Bu, Y. (2014). Effect of physical exercise on college students' mobile phone addiction. *Modern Preventive Medicine*, 41(07), 1242-1244+1248.
- Buchanan, R., & Csikszentmihalyi, M. (1991). Flow: The psychology of optimal experience. *Design Issues*, 08(01).
- Butensky, S., Kim, J., Godfrey, E., Su, D. G., Kerekes, D., & Johnson, C. H., et al. (2025). Evaluation of social support, discrimination, and perceived health in patients with gastrointestinal tract cancers. *Journal of Clinical Oncology*, 43(4_suppl), 802-802.
- Cao, D. (2021). Study on the relationship between life events and mobile phone addiction of higher vocational students. *Shanxi Youth*, (17), 07-09.
- Cao, H., Qian, J., Tang, F., Dong, Y., Ren, H., & Xue, X., et al. (2025). How trait mindfulness protects late adolescents from stress-induced sleep problems: the unique role of mindfulness facets and gender differences. *BMC Psychiatry*, 24(1).
- Cao, X. (2022). *Study on the relationship between adolescent negative life events and self-injury behavior: The chain mediation role of emotion regulation self-efficacy and experience avoidance*. (Master dissertation), Changchun Normal University, Available from Cnki.
- Caplan, G. (1974). Support systems and community mental health: Lectures on concept development. *Contemporary Sociology*, 05(02), 577-579.
- Center, C. I. N. I. (2025). *The 55th Statistical Report on Internet Development in China*. [online] Available at: <http://www.100ec.cn/home/detail--6599998.html>
- Chen, J., Li, W., An, Y., Zhang, Y., Du, J., & Xu, W. (2019). PSS mediates the relationships of dispositional mindfulness to job burnout and posttraumatic stress disorder among chinese firefighters. *Psychological Trauma: Theory, Research, Practice, and Policy*.

- Chen, L., Yan, Z., Tang, W., Yang, F., Xie, X., & He, J. (2016). Mobile phone addiction levels and negative emotions among Chinese young adults: The mediating role of interpersonal problems. *Computers in Human Behavior*, 55, 856-866.
- Chen, S., Cui, H., Zhou, R., & Jia, Y. (2012). Revision of mindful attention awareness scale (MAAS). *Chinese Journal of Clinical Psychology*, 20(02), 04.
- Chiu, S. I. (2014). The relationship between life stress and smartphone addiction on Taiwanese university student: A mediation model of learning self-efficacy and social self-efficacy. *Computers in Human Behavior*, 34(05), 49-57.
- Choliz, M. (2010). Mobile phone addiction: A point of issue. *Addiction*, 105(02), 373-374.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, 38(05), 300-314.
- Coplan, R. J., Ooi, L. L., & Baldwin, D. (2018). Does it matter when we want to be alone? Exploring developmental timing effects in the implications of unsociability. *New Ideas in Psychology*, 53.
- Coplan, R. J., Rose-Krasnor, L., Weeks, M., & Kingsbury, A. (2013). Alone is a crowd: social motivations, social withdrawal, and socioemotional functioning in later childhood. *Developmental Psychology*, 49(05), 861-875.
- Creswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research fourth edition. *Boston, MA: Pearson Education*.
- Cui, H., Lang, S., Yang, J., Niu, S., Fan, Y., Fu, X., & Guo, Y. (2010). Construction of the life events scale military personnel. *Medical Journal of Chinese People's Liberation Army*(12), 03.

- Dahlem, N., Zimet, G., & Walker, R. (1991). The multidimensional scale of PSS: A confirmation study. *J Clin Psychol*, 52(06), 756-761.
- Dai, J., Dong, B., Wang, S., Wang, C., Chi, G., & Dong, X. (2011). Prevalence and influencing factors of SA and distress in college students. *Chinese Journal of public health*(09), 1084-1086.
- Davidson, R. J. (2010). Empirical explorations of mindfulness: Conceptual and methodological conundrums. *Emotion*, 10(01), 08-11.
- Davis, R. A. (2001). A cognitive-behavioral model of pathological internet use. *Computers in Human Behavior*, 17(02), 187-195.
- Dell, R., B., Holleran, S., & Ramakrishnan, R. (2002). Sample size determination. *Institute for laboratory Animal Research Journal*, 43, 207-213.
- Devellis, R. F. (2011). *Scale development: Theory and application*, Thousand Oaks, California: SAGE Publication Inc.
- Ding, X., Zu, J., & Zhang, X. (2018). The effects of inhibition control training in mobile phone dependency college students. *Studies of Psychology and Behavior*, 16(03), 07.
- Dong, J., Liu, W., Zhou, C., Sun, Y., & Chen, G. (2020). The relationship between perceived discrimination and learning burnout of secondary vocational students: The mediating effect of professional identity and psychological capital. *Chinese Journal of Special Education*, 20(04), 76-80.
- Du, L., & Xiong, S. (2009). A research on the situation of mobile phone dependency among college students and the counter measures. *Journal of Chengdu Normal University*, 25(07), 26-28.

- Durham, E. L., Micciche, E. T., Reimann, G. E., Archer, C., Jeong, H. J., & Dupont, R. M. (2025). Emotion regulation strategies as moderators of the relationship between negative life events and trait anxiety. *Journal of Affective Disorders*, 370(000).
- Eagly, A. H., & Wood, W. (2012). *Social role theory: Volume Two*, London: Sage.
- Fan, F., Geng, F., Zhang, L., & Zhu, Q. (2011). Posttraumatic stress symptoms, NLE and social supports: A longitudinal study of survival adolescents following the 2008 Wenchuan earthquake. *Acta Psychologica Sinica*, 43(12), 10.
- Fan, F., Sheng, Y., Liu, H., & Dai, B. (2023). The effect of mindfulness on smartphone addiction among college students: The mediating role of depression. *Journal of Tianjin Medical University*(02), 194-198.
- Fang, J., Wen, Z., Zhang, M., & Sun, P. (2014). Analyzing multilevel mediation using multilevel structural equation models. *Advances in Psychological Science*, 530.
- Fan, X., & Su, L. (2020). Mobile phone use among college students and its influence on health. *Strait Journal of Preventive Medicine*, 26(05), 24-26.
- Fu, Y. (2018). Life events affected on the college students' mental health. *Journal of Yanan University(Natural Science Edition)*, 37(04), 68-71.
- Furman, W., & Buhrmester, D. *Network of relationships questionnaire manual*.
- Gao, H., Lin, W., Hu, X., & Zhao, S. (2020). NLE and depression of impoverished college students: The chain mediating effects of the feelings of inadequacy, SA and distress. *Journal of Wenzhou University (Natural Science Edition)*, 41(04), 55-61.

- Gao, S. (2017). A study on the mechanism between life events and subjective well being of college students: Psychological capital and social support as mediators. *Education Research Monthly*(03), 95-99.
- Gao, S. (2018). Quantitative and comprehensive analysis of the relationship between life events and mental health of chinese college students. *Modern Preventive Medicine*, 45(10), 1812-1815.
- Garland, E., Gaylord, S., & Park, J. (2009). The role of mindfulness in positive reappraisal. *Explore*, 05(01), 37-44.
- Ge, R., Zhong, X., & Chen, R. (2015). Influence of exercise intervention on CPA in university students. *Modern Preventive Medicine*, 42(21), 03.
- Guo, P., Gao, K., Jiang, & M. (2023). Anxiety and relation with work family conflict and perceived social support in college teachers. *Chinese Mental Health Journal*(07), 610-615.
- Guo, Q., Xv, M., Xv, C., & Liu, X. (2021). The relationship between university students dormitory relationship disturbance and mobile phone addiction: A sequential mediation model and gender differences. *Studies of Psychology and Behavior*(05), 650-656.
- Guo, X. (2000). Study on cause of social anxiety. *Psychological Exploration*(01), 04.
- Gülden, idem, & Polat, K. (2024). Mobile phone addiction, emotion regulation, mindfulness, and self-control among adolescents: a serial mediation analysis. *Erzincan University Journal of Education Faculty / Erzincan Üniversitesi Eğitim Fakültesi Dergisi*, 26(4).

- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Education, P. (2013). Multivariate data analysis: Pearson new international edition. *Pearson Schweiz Ag*, 03(02), 128-34.
- Haschke, K. J., Whitaker, W., & Sparrow, J. A. (2018). Mobile mindfulness: Effectiveness of brief practices on depression, anxiety, and stress. *Academic Leadership Journal in Student Research*(01).
- Hea-Young, Cho, Dai, Jin, Kim, & Jae, et al. (2017). Stress and adult smartphone addiction: Mediation by self-control, neuroticism, and extraversion. *Stress and Health Journal of the International Society for the Investigation of Stress*.
- He, A., Wan, J., & Hui, Q. (2021). The relationship between life events and CPA in adolescents: A cross-lagged study. *Chinese Journal of Clinical Psychology*, 29(02), 366-369.
- Hirschi, T. (1969). *A control theory of delinquency*.
- Hobfoll, S. E. (1989). Conservation of resources. A new attempt at conceptualizing stress. *American Psychologist*, 44(03), 513-524.
- Holmes, T. H., & Rahe, R. K. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research*, 11(02), 213-218.
- Hou, J. (2004). *Structural equation model and its applications: Economic Science Press*.
- Hu, W., Wang, Y., & Gao, L. (2021). SA and distress of university students in science and technology - A case study of Kunming University of Science and Technology. *Journal of Taiyuan Urban Vocational College*(05), 03.

- Hu, M., Chua, X. C. W., Diong, S. F., Kasturiratna, K. T. A. S., Majeed, N. M., & Hartanto, A. (2025). Ai as your ally: the effects of ai-assisted venting on negative affect and perceived social support. *Applied Psychology: Health and Well-Being*, 17(1).
- Huang, Q., & Gamble, J. (2015). Social expectations, gender and job satisfaction: front-line employees in China's retail sector. *Human Resource Management Journal*, 25(03).
- Huang, Q., Guo, J., Peng, H., Li, L., Wu, L., Zhou, H., & Tian, F. (2021). Relationship between life events and anxiety in adolescents: A moderated mediation model. *China Journal of Health Psychology*(12), 1892-1896.
- Huang, X., Zhang, Z., & Huang, J. (2013). Research on the relationship between the college students' SA and distress and life events. *Journal of Jiamusi Vocational Institute*(06), 339-340.
- Jenaro, C., Flores, N., Gomez-Vela, M., Gonzalez-Gil, F., & Caballo, C. (2007). Problematic internet and cell-phone use: Psychological, behavioral, and health correlates. *Addiction Research*, 15(03), 309-320.
- Ji, X. (2023). *The relationship between stressful life events and problematic use of short-form video apps among college students: A moderated mediation model*. (Master dissertation), Sichuan Normal University, Available from CNKI.
- Jiang, Q. (2004). *Medical Psychology*. 4th ed, Beijing: People's Medical Publishing House.
- Jiang, Q. (2012). *Medical Psychology - Theory, Method and Clinic*. 6th ed, Beijing: People's Medical Publishing House.
- Kabat-Zinn, J. (2010). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology Science and Practice*, 10(02), 144-156.

- Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *Public Opinion Quarterly*, 37(04).
- Kim, H. (2013). Exercise rehabilitation for smartphone addiction. *J Exerc Rehabil*, 09(06), 500-505.
- Kirwil, L. (2009). Parental mediation of children's Internet use in different european countries. *Journal of Children and Media*, 03(04), 394-409.
- Kok, R. (2025). A retrospective study of the influence of life events and social support on relapses and recurrences in older patients with bipolar disorder. *Geriatrics*, 10.
- Lancaster, G.A., Dodd S., Williamson P.R. (2004). Design and analysis of pilot studies: Recommendations for good practice. *Journal of evaluation in clinical practice*, 10(02), 307–12.
- Lazarus, R. S. (2000). *Cognitive-motivational-relational theory of emotion*, 05.
- Leary, M. R. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin*, 09(03), 371-375.
- Jonghwan, Lee, Jongmin, Lim, Hanbek, & Son, et al. (2016). Development and validation of a smartphone addiction scale based on behavioral addiction criteria. *The Korean Journal of Counseling and Psychotherapy*, 28(02), 425.
- Lee, S. J., & Chae, Y. G. (2007). Children's Internet use in a family context: Influence on family relationships and parental mediation. *Cyberpsychology and Behavior*, 10(05), 640-644.
- Lei, H. (2018). The difference in thinking styles between students of liberal arts and science in medical college. *Social Sciences Journal of Universities in Shanxi*(12), 61-64.

- Leung, L., Konijn, E. A., Tanis, M. A., Utz, S., & Linden, A. (2007). Leisure boredom, sensation seeking, self-esteem, addiction symptoms and patterns of mobile phone use.
- Li, B., & Ma, C. (2004). A deep interview with the anxious teenage in social activity. *Journal of Beijing Institute of Technology(Social Sciences Edition)*(06), 37-39.
- Li, H., Liu, Q., Fang, X., & Lin, X. (2007). A study on suicidal behavior and its related factors among undergraduates in Yunnan province. *Psychological Development and Education*(03), 56-61.
- Li, H., & Qianjin, J. (1996). The correlation between coping style, social support and psychosomatic symptoms in cancer patients. *Chinese Mental Health Journal*, 10(04), 02.
- Li, J., Li, S., & Wang, P. (2016). Effect of mindfulness-based stress reduction on disability acceptance, SA and distress in facial burn patients. *Journal of Nursing Administration*(02), 03.
- Li, J., Yuan, L., & Tian, S. (2020). Research on protective roles of mindfulness, coping and social support on effect of fertility problem on fertility quality of life. *Chinese Nursing Research*, 34(10) : 1693-1699.
- Li, L., Chen, M., Cheng, Y., Song, C., Li, Y., & Chen, C. (2020). Relationship between relative deprivation and depression in college students: The chain mediating effect of PSS and SA and distress. *China Journal of Health Psychology*, 28(11), 1700-1704.
- Li, Q., Huang, H., Wang, Y., & Chen, K. (2021). The relationship between CPA and anxiety and sleep quality among college students. *Practical Preventive Medicine*, 28(06), 750-753.

- Li, W. (2002). Study on the status and characteristics of self-acceptance of college students. *Journal of Ningxia University(Humanities & Social Sciences Edition)*(01), 112-114.
- Li, X., Liu, F., Du, R., Wu, M., & Shen, Y. (2016). The effect of PSS on SA and distress of people with disabilities: The moderating role of self-esteem. *Psychology Techniques and Applications*, 4(11), 08.
- Li, Y. (2008). Relevant research related to occurrences in college students' life and anxiety. *Journal of Baicheng Normal College*(02), 104-109.
- Li, Y. (2020). *The relationship and intervention study of mindfulness and cell phone dependence of college students: The mediating role of self-control*. (Master dissertation), Northeast Normal University, Available from Cnki.
- Li, Y., Shen, X., & Wang, J. L. (2025). Association between negative life events and suicidal behavior in adolescents: roles of core self-evaluation, depression and gender. *Social Psychiatry and Psychiatric Epidemiology*, 60(3), 673-684.
- Liang, B., & Hao, Z. (2005). Development of psychological stress scale for chinese college students. *Studies of Psychology and Behavior*, 03(02), 81-87.
- Liang, H., Xiao, W., & Jiang, H. (2024). Alexithymia and problematic mobile phone use among college students with and without siblings: The role of loneliness and mindfulness. *Current Psychology*, 43(26).
- Liang, Z., Lu, L., Ji, J., Zhu, S., & Yu, J. (2004). A study on contributing factors to SA and distress in college students. *Chinese Journal of School Health*, 25(03), 02.

- Linda, W. P., Marroquin, B., & Miranda, R. (2012). Active and passive problem solving as moderators of the relation between negative life event stress and suicidal ideation among suicide attempters and non-attempters. *Archives of Suicide Research, 16*(03), 183-197.
- Liu, B., Xu, H., Wei, H., & Song, Y. (2025). Why can parents' phubbing affect mobile phone addiction? Perspective of the i-space model. *Frontiers in Psychiatry, 20*, 25.
- Liu, D., & Li, D. (2017). Parenting styles and adolescent internet addiction: An examination of the mediating and moderating roles of ego-resiliency. *Journal of Psychological Science, 40*(06), 07.
- Liu, G., Liu, Y., Chen, Z., Zhou, S., & Ma, L. (2025). Network analysis of autism traits and problematic mobile phone use and their associations with depression among chinese college students. *Frontiers in Psychiatry, 1*.
- Liu, M. (2023). *The relationship and family cohson, perceivd social support and life meaning of junior high school students and intervention study*. (Master dissertation), Hefei Normal University, Available from CNKI.
- Liu, Q., Fang, X., Wan, J., & Zhou, Z. (2016). Need satisfaction and adolescent pathological internet use: Comparison of satisfaction perceived online and offline. *Computers in Human Behavior, 55*, 695-700.
- Liu, Q., Li, T., & Yuan, W. (2013). Analysis on the problems and countermeasures of contemporary college students' psychological health. *Education and Teaching Forum*(27), 02-04.

- Liu, Q., Zhou, Z., Yang, X., Kong, F., Sun, X., & Fan, C. (2018). Mindfulness and sleep quality in adolescents: Analysis of rumination as a mediator and self-control as a moderator-sciencedirect. *Personality and Individual Differences*, 122, 171-176.
- Liu, S. (2023). *The effect of perceived social support on future work self salience: The role of career exploration and proactive personality*. (Master dissertation), Southwest University, Available from Cnki.
- Liu, S., & Ling, W. (2009). Multiple mediation models and their applications. *Psychological Science*, 32(02), 433-432.
- Liu, X., Liu, L., Yang, J., Chai, F., Wang, A., Sun, L., & Ma, D. (1997). Reliability and validity test of adolescent life events scale. *Chinese Journal of Clinical Psychology*(01), 39-41.
- Liu, Y., He, S., Xue, L., Chen, C., Li, J., Cai, J., & Zhang, W. (2021). Relation of family function and life events to adolescent internet addiction in Shanghai. *Modern Preventive Medicine*, 48(13), 2383-2387.
- Liu, Y., Ma, H., & Gao, F. (2023). The relationship between fatherly rearing styles and mobile phone dependency among middle school students: The mediating role of loneliness and self-esteem. *Chinese Journal of Health Statistics*(02), 199-202.
- Luo, X., Jiao, G., Xiu, L., Chen, J., & Li, W. (2020). Effects of pregnancy life events and social support on the mental health and well-being of pregnant women. *China Journal of Health Psychology*, 28(12), 06.
- Luo, Y., Kong, F., Niu, G., & Zhou, Z. (2017). The relationship between stressful events and junior high school students' depression: The role of motives for internet use and internet use intensity. *Psychological Development and Education*(03), 337-344.

- Mankowski, E. S., & Wyer, J. R. S. (1996). Cognitive-processes in PSS. *Personality and Social Psychology Bulletin*, 22(09), 894-905.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50, 370-396.
- Ma, X. (2023). *Research on the internal mechanism and intervention of attention bias of college students with mobile phone addiction*. (Master dissertation), Yangzhou University, Available from Cnki.
- Ma, Y., Lu, M., Li, J., Yuan, X., Fan, J., & Cheng, M. (2022). Correlation analysis of self-management and social support for hypertensive patients in rural areas of Shanxi. *Chinese Nursing Research*(21), 3845-3849.
- Mccroskey, J. C., Beatty, M. J., Kearney, P., & Plax, T. G. (1985). The content validity of the prca-24 as a measure of communication apprehension across communication contexts. *Communication Quarterly*, 33(3), 165-173.
- Mesmer-Magnus, J., Tedone, A. M., Viswesvaran, C. V., & Allen, J. W. (2017). Trait mindfulness at work: A meta-analysis of the personal and professional correlates of trait mindfulness. *Human Performance*, 1-20.
- Min, J. (2019). Relationship between covert narcissism and SNS addiction proneness in college students: Mediation model of cognitive distortion and social anxiety. *Journal of Social Science*, 10, 101-115.
- Moksnes, U. K., Moljord, I. E. O., Espnes, G. A., & Byrne D. G. (2010). The association between stress and emotional states in adolescents: the role of gender and self-esteem. *Personality and Individual Differences*, 49(05), 430-435.

- Molavi, S., Khorrami, N. S., Ehteshamzadeh, P., & Bargard, M. S. (2020). Effectiveness of mindfulness-based cognitive therapy on sleep quality and PSS improvement in patients with HIV/AIDS. *Jundishapur Journal of Chronic Disease Care*, 09(01).
- Morris, M., & Ogan, C. (1996). The Internet as mass medium. *Journal of Communication*, 46(01), 39-50.
- Mowen, J. C. (2000). *The 3M model of motivation and personality*.
- Mrazek, M. D., Franklin, M. S., Phillips, D. T., Baird, B., & Schooler, J. W. (2013). Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychol*, 24(05), 776-781.
- Mrazek, M. D., Smallwood, J., & Schooler, J. W. (2012). Mindfulness and mind-wandering: Finding convergence through opposing constructs. *Emotion*, 12(03), 442-448.
- Olçay Imamoglu, & Zahide Karakitapoglu-Aygün. (2010). Actual, ideal, and expected relatedness with parents across and within cultures. *European Journal of Social Psychology*, 36(05), 721-745.
- Pallant, J. (2010). *SPSS survival manual 4th ed: A step by step guide to data analysis using SPSS program*, Mc Graw Hill: New York.
- Peng, C., Gong, Y., & Zhu, X. (2004). The applicability of interaction anxiousness scale in Chinese undergraduate students. *Chinese Mental Health Journal*, 18(01), 3.
- Peng, Y., Yin, S., Wu, Y., Zhang, Y., Tian, K., & Zhang, X. (2023). A study on mindfulness interventions to reduce smartphone addiction in college students. *Advances in Psychology*, 13(09), 3825-3833.

- Peng, Y., & Ju, M. (2013). The "Heart" of the working mechanism of mindfulness: Attention or attitude? *Journal of Psychological Science*(04), 1009-1013.
- Pu, Y., Yang, D., & Yan, W. (2023). The Relationship between negative life events and short video addiction among college students:The mediating role of self compensation motivation. *Journal of Nanjing University of Traditional Chinese Medicine(Social Science Edition)*(03), 204-210.
- Qiu, Z., Xu, Y., Luo, X., Xiong, S., & Zhang, B. (2020). Relationship between college students self-concept and mobile phone addiction: The moderating effect of mindfulness. *China Journal of Health Psychology*, 28(11), 1679-1682.
- Onu, D. U., Obikeguna, C. N., Onyishi, E. I., & Igwe, E. J. (2025). Does perceived social support buffer the impact of psychological distress on health-related quality of life among people living with tuberculosis?
- Qu, X. (2021). Development, reliability and validation of the adolescent daily school life event scale and equivalence test of cross segment measurement: Based on ordered classification data. *Chinese Journal of Clinical Psychology*, 29(05), 710-716.
- Qv, T. (2023). *The relationship between mindfulness and daily academic resilience in junior middle school students: Partial mediation by meta cognition*. (Master dissertation), Tianjin Normal University, Available from CNKI.
- Radosavljić, V. R., Janković, S. M., & Marinković, J. M. (1996). Stressful life events in the pathogenesis of Graves' disease. *European Journal of Endocrinology*, 134(06), 699-701.

- Reynolds, L. M., Lin, Y. S., Zhou, E., & Consedine, N. S. (2015). Does a brief state mindfulness induction moderate disgust-driven SA and decision-making? An experimental investigation. *Journal of Behavioral Medicine*, 38(01).
- Rizeq, J., Kennedy, M., Miseih, K., Liao, W., & Sonuga-Barke, E. J. S. (2025). Early childhood deprivation and the impact of negative life events on mental health in later life: A test of the stress sensitization hypothesis. *Frontiers in Psychiatry*.
- Sang, B., Ding, X., Coplan, R. J., Liu, J., Pan, T., & Feng, X. (2016). Assessment and implications of SA in Chinese early adolescents. *The Journal of Early Adolescence*, 01-20.
- Sarason, B. R., Pierce, G. R., Shearin, E. N., Sarason, I. G., Waltz, J. A., & Poppe, L. (1991). PSS and working models of self and actual others. *Journal of Personality and Social Psychology*, 60(02), 273-287.
- Sarason, I. G., & Johnson, J. H. (1976). *The life experiences survey: Preliminary findings*.
- Sarason, I. G., Levine, H. M., & Sarason, B. R. (1983). Assessing social support: The social support questionnaire. *Journal of Personality and Social Psychology*, 44(01), 127-139.
- Selye, H. (1976). *The stress of life: The stress of life*.
- Shan, Z., Wang, W., Lv, X., Li, G., Zhang, J., & Feng, F. (2017). The interaction of parenting style, life events and interpersonal relationships. *Education Research Monthly*(05), 38-46.
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2010). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62(03), 373-386.

- Shi, J. (2009). Cell phone dependence syndrome. *Journal of Clinical Psychiatry*, 19(02), 02.
- Siegel, R. D. , Germer, C. K. , & Olendzki, A. . (2009). *Mindfulness: what is it? where did it come from?*, New York: Springer New York.
- Song, C., Chen, M., Li, W., Li, L., & Li, Y. (2020). The effect of PSS on depression among college students: The chain mediating effect of SA and distress and core self-evaluation. *Psychology: Techniques and Applications*, 08(07), 423-430.
- StatTrek. (2017). *Sample size: Stratified random samples*. [online] Available at: [http:stattrek.com/sample-size/stratified-sample.aspx](http://stattrek.com/sample-size/stratified-sample.aspx).
- Stevens, J. (1986). *Applied Multivariate Statistics for the Social Sciences*, New York: Taylor & Francis Group.
- Su, S., Pan, T., Liu, Q., Chen, X., Wang, Y., & Li, M. (2014). Development of the smartphone addiction scale for college students. *Chinese Mental Health Journal*, 28(05), 392-397.
- Tang, J., Ma, Y., Guo, Y., Liu, H., Xing, Y., Chen, Y., & Yv, Y. (2014). Psychosocial factors for non-suicidal self-injury among urban middle school students in Guangdong Province. *Chinese Journal of School Health*(06), 806-808.
- Tan, L. (2004). Correctly understand the psychological self-defense mechanism of students. *Chinese Vocational and Technical Education*(14), 24-26.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics*, 6th ed., USA: Pearson.

- Tang, H., & Zhou, M. (2014). Relationship between life events, cognitive emotion regulation and resilience in college students. *China Journal of Health Psychology*, 22(03), 441-443.
- Tao, J., Chen, F., & Pei, D. (2017). Application of mindfulness training intervention in patients with insomnia. *Chinese Journal of General Practice*, 15(08), 05.
- Tao, S., Fu, J., Wang, H., Hao, J., & Tao, F. (2013). Development of self-rating questionnaire for adolescent problematic mobile phone use and the psychometric evaluation in undergraduates. *Chinese Journal of School Health*(01), 04.
- Teng, S., Zhao, J., Zhang, X., Zhao, J., Yang, X., & Chen, J. (2017). Chain mediating effect of mindfulness and sleep quality between NLE and depression among college students. *Chinese Journal of Behavioral Medicine and Brain Science*, 26(09), 815-819.
- Thera, N. (1994). *The Power of Mindfulness*.
- Tiegs, F. R. B. (2010). The main effect model versus buffering model of shop steward social support: a study of rank-and-file auto workers in the USA. *Journal of Organizational Behavior*, 14(5), 481-493.
- Toda, M. T., Ezoe, S., Nishi, A., Mukai, T., Goto, M., & Morimoto, K. (2008). Mobile phone dependence of female students and perceived parental rearing attitudes. *Social Behavior and Personality: an international journal*, 36(06), 765-770.
- Tu, B., Zhang, J., & Jiang, Y. (2010). Preliminary preparation of questionnaire on mobile phone addiction tendency of college students. *Journal of Hotan Normal College*.
- Tu, W. (2016). A study on the relationship between social support, loneliness and cell phone dependence of college students. *The Guide of Science and Education*(20), 166-168.

- Waal, N. D., Ivan Nykliek, Gucht, K. V. D., Pop, V. J. M., & Boekhorst, M. G. B. M. (2025). Mindfulness, self-compassion, and psychological wellbeing as correlates of paternal bonding in pregnancy. *Journal of Child and Family Studies*, 34(2), 433-447.
- Walsh, S. P., White, K. M., & Young, R. M. (2007). *Young and connected: Psychological influences of mobile phone use amongst Australian youth*.
- Wang, B., Li, S., Wang, W., & Wang, X. (2021). The influence of self-identity on social avoidance and distress in college students: The mediating effect of the fear of negative evaluation. *Journal of China Medical University*(12), 1107-1111.
- Wang, G., Wu, H., & Zeng, G. (2023). College students' professional identity and depression: Moderated mediation analysis. *China Journal of Health Psychology*, 31(04), 592-598.
- Wang, H., Huang, H., & Wu, H. (2014). Relationship between personality and mobile phone addiction: A mediating role of social anxiety. *Chinese Journal of Clinical Psychology*(03), 447-450.
- Wang, J. (2015). An analysis on the reinforcement theory of cellphone dependence. *Journal of Chaohu University*, 17(05), 04.
- Wang, J. (2011). *Status quo of internet addiction among college students and its correlation with learning motivation: A case study of Zhengzhou*. (Master dissertation), Central China Normal University.
- Wang, M., Tian, L., Jiang, N., Wang, B., Zhang, Q., Chen, Y., & Ni, C. (2021). Current situation and influencing factors of CPA of officers and soldiers in an army unit. *Occup and Health*, 37(21), 2951-2954.

- Wang, Q., Wang, P., Han, L., Gong, R., & Gao, F. (2009). The revision of college students' shyness scale and its relevant study. *Psychological ence*.
- Wang, S., Geng, Y., Li, Y., Zhang, M., Xie, Q., & Sun, W. (2021). To analyze the level and influencing factors of social avoidance and distress in preventive medical students. *Chinese Journal of Health Statistics*(02), 238-240.
- Wang, X. (2011). *Research on the situation of mobile phone dependency and the relationship among CPA, social support and social adaptation for middle school students*. (Master dissertation), Fujian Normal University, Available from CNKI.
- Wang, Y. (2007). SA and distress and their perception of social support among college students. *Chinese Journal of School Health*(03), 235-237.
- Wang, Y., & Zhang, Y. (2015). Relation of mobile phone addiction to PSS and subjective well-being in college students. *Chinese Mental Health Journal*, 29(11), 868-873.
- Wang, Z., Wu, Q., & Dai, X. (2021). Summary of domestic research on advantage perspective theory. *Advances in Social Sciences*, 10(4), 05.
- Watson, D., & Friend, R. (1970). "Measurement of social-evaluative anxiety": Erratum. *Journal of Consulting and Clinical Psychology*, 35(01), 69-69.
- Wei, L., & Zhang, S. (2021). Effects of psychosocial support system on anxiety symptoms and sleep quality in patients with generalized anxiety disorder. *China Journal of Health Psychology*(06), 806-809.
- Wei, M., Zhao, D., Wang, W., & Ni, J. (2013). The relationship between freshman learning burnout and school maladjustment. *China Journal of Health Psychology*(09), 1416-1418.

- Wen, Z., Hau, K.-T., & Lei, C. (2005). A comparison of moderator and mediator and their applications. *Acta Psychologica Sinica*(02).
- Williamson, G., & Althoff, R. (2012). Kirsh steven J. media and youth: A Developmental Perspective. John Wiley and Sons-West Sussex, UK (2010). \$49.95 (Softcover). *Biology of Reproduction*, 84(03), 74-90.
- Wilson, J. M., Weiss, A., & Shook, N. J. (2020). Mindfulness, self-compassion, and savoring: Factors that explain the relation between PSS and well-being. *Personality and Individual Differences*, 152(C).
- Wolfradt, U., Hempel, S., & Miles, J. N. V. (2003). Perceived parenting styles, depersonalisation, anxiety and coping behaviour in adolescents. *Personality and Individual Differences*(03), 521-532.
- Wood, A. M., Maltby, J., Gillett, R., Linley, P. A., & Joseph, S. (2008). The role of gratitude in the development of social support, stress, and depression: Two longitudinal studies. *Journal of Research in Personality*, 42(04), 854-871.
- Wu, J., Lin, D., & Jiang, Q. (2001). *Medical Psychology course: Medical Psychology course*.
- Wu, Q., Luo, J., Bai, J., Hou, M., & Li, X. (2019). Effect of security on mobile addiction: Mediating role of actual social avoidance. *Psychological Development and Education*(05), 589-596.
- Wu, Y., & Qin, L. (2025). Enhancing wellbeing among pre-service teachers through a mindfulness-based social and emotional learning curriculum: a quasi-experimental study in China. *Frontiers in psychology*, 16(000).

- Wu, W., & Xiang, X. (2020). Relations between university students peer communication and mental health: The mediating effect of social skills. *China Journal of Health Psychology*(04), 585-591.
- Xiao, S. (1994). Theoretical basis and research application of social support rating scale. *Journal of Clinical Psychiatry*, 04(02), 03.
- Xiao, Y. (2018). The relationship between life events, social support and Internet addiction among college students. *The Farmers Consultant*(18), 02.
- Xia, Y., Schyns, B., & Zhang, L. (2020). Why and when job stressors impact voice behaviour: An ego depletion perspective. *Journal of Business Research*, 109.
- Xing, N. (2020). *The influence of resilience on mobile phone dependency among secondary vocational school students: The mediating effect of self-control*. (Master dissertation), Jilin University, Available from Cnki.
- Xiong, J., Zhou, Z., Chen, W., You, Z., & Zhai, Z. (2012). Development of mobile phone addiction tendency scale for college students. *Chinese Mental Health Journal*, 26(03), 04.
- Xiong, M. (2016). *The effect of the mindfulness training in trait anxiety and SA and distress among adolescents*. (Master dissertation), Jiangxi Normal University, Available from CNKI.
- Xu, H., Wu, X., Lan, Y., & Chen, Y. (2008). Development of CPA inventory for college students. *Chinese Journal of Clinical Psychology*, 16(01), 02.
- Xu, W., Fu, Z., Wang, Y., Wang, X., & An, Y. (2017). Impact of daily stress on daily anger: Moderating role of dispositional mindfulness. *Chinese Journal of Clinical Psychology*, 25(03), 485-488.

- Xu, W., Liang, Q., Luo, S., & Han, X. (2017). Comparative study of the solution-focused brief therapy in the treatment of college students with mobile phone addiction. *Chinese Journal of Special Education*(02), 06.
- Xue, Y. (2023). *The interaction of negative life events and mental health literacy on emotional symptoms among college students*. (Master dissertation), Anhui Medical University of Finance and Economics, Available from CNKI.
- Xu, W. (2022). Influence of trait mindfulness on self-esteem of college students: Mediating effect of physical self-esteem. *Journal of Shandong Sport University*, 38(01), 112-118.
- Yao, S., Yang, Y., Yang, Y., Pan, F., & Zhao, X. (2013). *Medical Psychology*, Beijing: People's sanitary publishing press.
- Yang, C. (2006). Correlation between the psychological health of teachers and social support. *Chinese Journal of Tissue Engineering Research*, 10(38), 04.
- Yang J., Zhu B., & Wu Y. (2025). The relationship between perceived stress and college students' mobile phone dependence: A chain mediating effect model. *Advances in Psychology*, 15.
- Yang, S., Wang, Y., Wang, W., & Zheng, J. (2023). Influence of social support on trait emotional intelligence of college students: The intermediary effect of self-esteem. *Journal of North China University of Science and Technology(Social Science Edition)*(04), 77-83.
- Yang, X. (2021). *From automaticity to consciousness: Habitual mobile phone use and its relationship with mindfulness*. (Doctoral Dissertation), Central China Normal University.

- Ye, B., Fang, X., Yang, Q., Zheng, Q., Liu, L., & Guo, S. (2017). The Effects of Learning in Emotional Regulation on College students' Mobile Phone Addiction: The chain mediating effect of facial negative physical self and SA and distress. *Psychological Development and Education*, 33(02), 249-256.
- Ye, Y., Fan, F., Chen, S., Zhang, Y., Long, K., Tang, K., & Wang, H. (2014). The relationship between resilience, NLE and depressive symptoms: Stealing effect and sensitizing effect. *Journal of Psychological Science*, 37(06), 07.
- Yen, C., Tang, T., Yen, J., Lin, H., Huang, C., Liu, S., & Ko, C. (2009). Symptoms of problematic cellular phone use, functional impairment and its association with depression among adolescents in Southern Taiwan. *Journal of Adolescence*, 32(04), 863-873.
- Ying, X., Sun, H., & Liu, X. (2010). Status of SA and distress and the relation with personality in freshmen. *China Journal of Health Psychology*(10), 1253-1255.
- Yilmaz, S. E., & Tak, E. (2025). Exploring the effects of perceived social support and psychological distress through mediation and multigroup analyses in work-related quality of life. *Scientific Reports*, 15(1).
- Young, K. S. (2004). Internet addiction a new clinical phenomenon and its consequences. *American Behavioral Scientist*, 48(04), 402-415.
- Young, K. S. (2009). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychology and behavior*, 01(03), 237-244.
- Yu, S., Xu, W., Liu, X., & Xiao, L. (2019). A controlled study of mindfulness training intervening negative emotions and perceived stress in individuals. *Chinese Mental Health Journal*, 33(04), 273-278.

- Yuan, J. (2023). *The relationship between missed out anxiety and mobile social media dependence: The moderating role of perceived social support*. (Master dissertation), Tianjin Normal University, Available from CNKI.
- Zhang, C. (1992). *Chang's Dictionary of Psychology*, Shanghai: Shanghai Lexicographical Publishing House.
- Zhang, H., Lin, Y., Yang, Y., & Zhang J. (2023). Effect of alexithymia on mobile phone addiction among vocational college students: The mediation of negative evaluation fear and gender regulation. *China Journal of Health Psychology*(05), 705-710.
- Zhang, J. (2020). *A Study on the relationship between college students' professional identity, achievement motivation and academic delay*. (Master dissertation), Shanxi University of Finance and Economics, Available from CNKI.
- Zhang, J. (2019). The disability of male identity attribute and the rise of female independent consciousness: A brief analysis of the film "Ash is the purest white". *Home Drama*(05), 95.
- Zhang, J., & Li, X. (2008). Study of armed police soldier's mental healthy level in hunan province. *Chinese Journal of Clinical Psychology*(01), 83-85.
- Zhang, M., Fan, B., Cai, G., Chi, Y., Wu, W., & Jin, H. (1987). Life events scale: norm results. *Chinese Journal of Nervous and Mental Diseases*(02).
- Zhang, Q., & Liu, Z. (2021). Smartphone addiction proneness scale for adolescents-chinese version: revision and evaluation on reliability and validity. *Chinese Journal of Public Health*, 37(07), 04.

- Zhang, R., Li, T., Ge, L., & Xv, Y. (2016). Effects of group psychological training on CPA and self-esteem of high school students. *China Journal of Health Psychology*(09), 03.
- Zhang, S. (2025). The effects of physical activity on adolescent psychological sub-health: chain-mediated effects of self-control and mobile phone addiction. *BMC Psychology*, 13(1).
- Zhang, X., Gao, F., Geng, J., Wang, Y., & Han, L. (2018). SA and distress and mobile phone addiction: A multiple mediating model. *Chinese Journal of Clinical Psychology*, 26(03), 494-497.
- Zhang, X., & Zhu, H. (2014). The intervention effect of mindfulness-based cognitive therapy on college students with mobile phone addiction. *Studies of Psychology and Behavior*, 12(03), 04.
- Zhang, Y. (2016). *A study between mindfulness of knowledge worker and work thriving: Based on the partial mediator of employee relationship quality*. (Master dissertation), Dongbei University of Finance and Economics, Available from CNKI.
- Zhang, Z., Lu, Q., Liu, W., Chen, Z., Cheng, C., Ang, S., & Pan, M. (2023). Survey on mobile phone dependency among medical students and analysis of its influencing factors. *Chinese Journal of General Practice*(07), 1192-1196.
- Zhao, L., & Chen, H. (2010). Investigation and analysis of NLE of contemporary college students. *Journal of Chinese Youth Social Science*, 29(02), 22-26.
- Zhao, S., & Ye, J. (2019). Effects of feelings of inadequacy on life events, SA and distress among impoverished undergraduates. *American Journal of Applied Psychology*(01).

- Zhong, Y., Li, Y., & Guo, S. (2019). A study of interpersonal group training courses on improving college students ability of interpersonal communication. *China Journal of Health Psychology*(03), 431-434.
- Zhou, H., & Chen, Y. (2022). The relationship between mindful traits and sleep quality in vocational college students: The mediating role of mobile phone addiction. *Journal of Taiyuan Urban Vocational College*(04), 03.
- Zhou, H., & Long, L. (2004). Statistical remedies for common method biases. *Advances in Psychological Science*, 12(06), 942-950.
- Zhou, H., Zhang, B., Jiang, H., Tuo, A., & Li, B. (2022). Mediating roles of PSS and relative deprivation in the relationship between NLE and mobile phone addition among college students. *China Journal of Health Psychology*(07), 971-975.
- Zhou, W. (2023). *The effect of negative events on online aggressive behaviors: The mediating role of relative deprivation and the moderating role of empathy*. (Master dissertation), Jilin University, Available from Cnki.
- Zhu, W., & Hu, J. (2022). An empirical study on introducing mindfulness training into mental health education for college students. *Industrial and Science Tribune*(02), 65-66.
- Zilmer, B. M., Gritt, O., Volkert, S., & Philip, W. (2025). Recent life events and adverse childhood experiences in predicting antenatal depression and anxiety: cross-sectional study. *Family Practice*(1), 1.
- Zimet, G. D., Dahlem, N. W., & Zimet, S. G. (1988). The multidimensional scale of PSS: Journal of personality assessment. *Journal of Personality Assessment*, 52(01).

Zou, M. (2012). Mental health status of the only child and non-only child in a public security college in Jiangsu province. *New Courses' Study*(11), 178-179.

APPENDICES

Research title: The Relationship Between Negative Life Events and Cell Phone Addiction Among College Students: Examining the Mediating Roles of Perceived Social Support, Social Avoidance, and Mindfulness

The main objective:

To investigate the relationship between NLE and CPA, PSS, SA and ML as mediator among College Students.

The specific objectives:

The specific objectives of this study were:

- i. To determine the relationship between NLE and CPA among college students.
- ii. To determine the relationship between NLE and ML among college students.
- iii. To determine the relationship between NLE and PSS among college students.
- iv. To determine the relationship between NLE and SA among college students.
- v. To determine the relationship between ML and CPA among college students.
- vi. To determine the relationship between PSS and CPA among college students.
- vii. To determine the relationship between SA and CPA among college students.
- viii. To determine the ML as mediator for NLE on CPA among college students.
- ix. To determine the PSS as mediator for NLE on CPA among college students.
- x. To determine the SA as mediator for NLE on CPA among college students.

This study regarded college students as the research object, regarded NLE as the independent variable, regarded CPA as the dependent variable, regarded SA and PSS and ML as a mediate variable, trying to build on NLE, ML, SA, PSS and CPA of multiple mediation model. In this study, Adolescent Self-Rating Life Events Checklist (ASLEC), Social

Avoidance Scale (SAS), Perceived Social Support Scale (PSSS), Mobile Phone Addiction Tendency Scale (MPATS) and Mindful Attention Awareness Scale (MAAS) were used to measure the relationship of NLE, CPA, mindfulness, PSS and SA.



Faculty of Cognitive Sciences and Human Development

Universiti Malaysia Sarawak (UNIMAS)

Research Topic:

The Relationship Between Negative Life Events and Cell Phone Addiction Among College Students: Examining the Mediating Roles of Perceived Social Support, Social Avoidance, and Mindfulness

This research was to investigate the relationship between NLE and CPA, PSS, SA and ML as mediator among College Students. This questionnaire consisted of six sections.

Dear students: Hello! Thank you very much for taking the time to complete this questionnaire. Please read the questions carefully and answer them according to your actual situation. The answers to all questions are not good or wrong, please fill in the truth. The survey results are only used for academic research, and we will keep the information you provide strictly confidential. Thank you for your cooperation!

QUESTIONNAIRE FORM

SECTION A

Demographic Questionnaires

Instruction: Please base your answer on your first reaction. Please tick (✓) ONE in the box for each question. And all responses will only be used for preservation and academic purposes.

1. Gender:

☐ Male ☐ Female

2. Age: _____ Year

☐ 18-19 ☐ 20-21
☐ 22-23 ☐ 24 and above

3. Grade:

☐ Freshman ☐ Sophomore ☐ Junior

4. Major type:

☐ Arts ☐ Science

5. Only child:

☐ Yes ☐ no

6. Student cadre:

☐ Yes ☐ no

7. Family location:

☐ Urban areas ☐ Non-Urban areas

8. Faculty:

☐ Faculty of Architectural Engineering ☐ Faculty of Art
☐ Faculty of Management Engineering ☐ International Business Faculty
☐ Faculty of Information

SECTION B

Adolescent Self-Rating Life Events Checklist (ASLEC)

Instruction: In the second part, the researcher mainly wants to investigate your life events and other related circumstances. Please read the questions carefully and answer them according to your actual situation. In the past 12 months, have you experienced any of the following events? Please tick (✓) ONE in the box for each question. And all responses will only be used for preservation and academic purposes.

0=Not occurred

1=No effect

2=Slight negative effect

3=Moderate negative effect

4=Severe negative effect

5=Extremely negative effect

No.	Items	0	1	2	3	4	5
1.	Be misunderstood or misjudged						
2.	Get the cold shoulder from people						
3.	Fail an exam or get an unsatisfactory grade						
4.	Get into trouble with classmates or friends						
5.	Obvious changes in life patterns (diet, rest, etc.)						
6.	Don't like school						
7.	Relationships go wrong or lose love						
8.	Long distance from family can not be reunited						
9.	Heavy study load						
10.	Strained relations with teachers						
11.	I am seriously ill						
12.	A friend or relative is seriously ill						

13.	Death of a relative						
14.	Something stolen or lost						
15.	Lose face in public						
16.	Family financial difficulties						
17.	There are conflicts within the family						
18.	The expected selection (merit student, etc.) failed						
19.	Be criticized or punished						
20.	Transfer or suspend school						
21.	Be fined (in all aspects)						
22.	The pressure to pursue further education						
23.	Get into a fight						
24.	Beaten and scolded by parents						
25.	Family puts pressure on you to study						
26.	Accidental shock, accident						
27.	Other setbacks						

SECTION C

Mobile Phone Addiction Tendency Scale (MPATS)

In the third part, the researcher mainly wants to investigate your mobile phone usage. Please read the questions carefully and answer according to your actual situation. Please tick (✓) ONE in the box for each question. And all responses will only be used for preservation and academic purposes.

1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly agree

NO.	Items	1	2	3	4	5
1.	Without my phone for a while, I will immediately check for messages or missed calls.					
2.	I'd rather talk on my phone than talk face to face.					
3.	When I'm waiting for someone, I often call my cell phone to ask where the other person is, and if I don't call, I get anxious.					
4.	If I don't use my phone for a long time, I feel uncomfortable.					
5.	In class, I can't pay attention because of the phone or mobile phone.					
6.	I will feel lonely without my cell phone.					
7.	I feel more confident when I communicate with others on my phone.					

8.	When my phone doesn't ring for a while, I feel uncomfortable and subconsciously check for missed calls or texts.					
9.	I often have the illusion that my phone is ringing or my phone is vibrating.					
10.	More phone calls and more text messages will make my life more fulfilling.					
11.	I often fear that my phone will turn off automatically.					
12.	My phone is a part of me, and if I lose it, I feel like I'm losing something.					
13.	My classmates and friends often say that I rely too much on my mobile phone.					
14.	When my phone is often disconnected or has no signal, I become anxious and irritable.					
15.	In class, I often take the initiative to focus on the phone and affect the class.					
16.	I find it more comfortable to communicate with others by mobile phone.					

SECTION D

Mindful Attention Awareness Scale (MAAS)

In the fourth part, the researchers mainly want to investigate your level of mindfulness. Please read the questions carefully, consider each item in the light of the last few weeks, and answer according to your situation. Please tick (✓) ONE in the box for each question. And all responses will only be used for preservation and academic purposes.

1=Always 2=Often 3=Sometimes 4=Sometimes not 5=Often not 6=Never

NO.	Items	1	2	3	4	5	6
1.	I may not realize certain emotions until they have lasted for a while.						
2.	I may break something because I'm not careful, not paying attention, or thinking about something else.						
3.	I can't concentrate very well on what's happening right now.						
4.	Usually I will walk very fast without even realizing what it felt like to walk.						
5.	I would not have noticed any physical tension or discomfort if it has not been severe enough.						
6.	If someone tells me her (his) name for the first time, I forget it quickly.						
7.	I seem to be doing something automatically, without being fully aware of doing it.						
8.	Usually, I finish a task without giving it my full attention.						

9.	I am so focused on the goal that I lost sight of the process.						
10.	I always work mechanically or complete a task without realizing it.						
11.	Sometimes I'm doing something else while listening to a song or someone talking about something.						
12.	Sometimes I have an idea for automation, but later I don't know why.						
13.	I focus too much on the future or the past.						
14.	Sometimes I don't notice what I'm doing.						
15.	When I eat something, I always gobble it down rather than savor it.						

SECTION E

Perceived Social Support Scale (PSSS)

In the fifth part, the researchers mainly want to investigate your perceived social support. Please read the questions carefully, consider each item in the light of the last few weeks, and answer according to your situation.

1: Disagree strongly 2: Often not agree 3: Sometimes not agree 4: Neutral 5: Sometimes agree 6: Often agree 7: Agree strongly

NO.	Items	1	2	3	4	5	6	7
1.	My family can help me in concrete ways.							
2.	I can rely on my friends in time of trouble.							
3.	When I meet a problem, some people (such as teachers, classmates, relatives, etc.) will be there for me.							
4.	My family is willing to help me make decisions.							
5.	I can share happiness and sadness with some people (such as teachers, classmates, relatives, etc.).							
6.	I am able to get emotional help and support from my family when needed.							
7.	My friends can share happiness and sorrow with me.							
8.	When I am in trouble, some people (such as teachers, classmates, relatives, etc.) are my real source of comfort.							
9.	I can discuss my problems with my friends.							

10.	In my life, some people (such as teachers, classmates, relatives, etc.) care about my feelings.							
11.	I am able to talk to my family about my problems.							
12.	My friends can really help me.							

SECTION F

Social Avoidance and Distress Scale (SADS)

In the third part, the researcher mainly wants to investigate your mobile phone usage. Please read the questions carefully and answer according to your actual situation. Please tick (✓) ONE in the box for each question. And all responses will only be used for preservation and academic purposes.

1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly agree

NO.	Items	1	2	3	4	5
1.	I feel relaxed even in unfamiliar social situations.					
2.	I try to avoid situations that force me into social intercourse.					
3.	I relax easily when I'm with strangers.					
4.	I don't particularly want to avoid people.					
5.	I usually find social situations upsetting.					
6.	I usually feel calm and comfortable in social situations.					
7.	I usually feel relaxed when talking to the opposite sex.					
8.	I try to avoid talking to people unless I know them very well.					
9.	If there is an opportunity to meet new people, I will take it.					
10.	I usually feel anxious and nervous when the opposite sex is present at informal gatherings.					

11.	I usually feel anxious around people unless I know them very well.					
12.	I usually feel relaxed when I'm with a group of people.					
13.	I often want to get away from the crowd.					
14.	I feel uncomfortable in the company of people I don't know.					
15.	I'm usually relaxed when meeting someone for the first time.					
16.	Being introduced to others makes me feel nervous anxiety.					
17.	Although the room was full of strangers, I might have gone in.					
18.	I avoid going up and joining large groups of people.					
19.	I'm happy to talk to my boss when he wants to talk to me.					
20.	I usually feel butterflies in my stomach when I'm with a group of people.					
21.	I like to hide from people.					
22.	I have no problem talking to people in the evening or at social gatherings.					
23.	I rarely feel at home in a large group of people.					
24.	I often come up with excuses to avoid social activities.					
25.	I sometimes play the role of introducing people to each other.					
26.	I try to avoid formal social situations.					
27.	I usually participate in every social interaction I can. I usually go to any social event when I can.					
28.	I find it easy to relax in the company of others.					

End of questions !