Inspecting the impact of Big Five traits on internship stress and students' rethinking stress

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Abstract

This study aims to investigate the factors that contribute to internship stress among Vietnamese students by analyzing the associations between personality traits, internship stress, stress mindset, and demographics. A cross-sectional study design was utilized, comprising 149 Vietnamese students who were engaged in internship programs. The data gathering process encompassed the assessment of personality traits, internship stress levels, stress mindset, and participant demographics, which encompassed gender, age, GPA, and internship hours. We conducted path analyses to examine the relationships between these variables, and conducted moderation analyses to explore the interaction between age and the impact of extraversion on internship stress. Increased degrees of neuroticism were associated with a negative stress mindset, and this association was largely mediated by the stress experienced during an internship. Age moderated the negative association between the trait of extraversion and internship stress. More precisely, the association between extraversion and stress was significantly greater among younger students than it was among older students. Female students reported a lower stress mindset compared to male students, and higher GPAs were associated with both reduced internship stress and a more optimistic stress mindset. The results indicate that specific personality traits, such as neuroticism and extraversion, as well as internship stress, have a notable impact on the stress mindset of Vietnamese students. Gaining insight into these aspects can guide the development of internship programs that provide greater support and equip students with specific coping methods to enhance their well-being and manage internship difficulties more efficiently.

Keywords: Extraversion, Internship stress, Neuroticism, Personality, Stress mindset, Vietnamese students.

1. Introduction

A student transforming into an employee is a stage of every student's life that is complex and multifaceted. In undergraduate programs, it takes place during internships and aims to gain job-specific skills and practical knowledge [1]. The internship programs help increase students' experience, develop personal and team skills [2-4,] and narrow the gaps between theory and practice [5]. Moreover, the internship programs help create students who are more matchable and competitive workers at the end of their educational journey [6-8].

On the other hand, the novelty of the work environment, performance requirements, and the need to quickly adapt to that environment can lead to an increase in stress during internship [9, 10]. Clearly, this stress affects interns' well-being and performance and, consequently, their experience [11]. Therefore, to facilitate the shift, it makes sense to investigate the causes and specific responses to the specific type of stress.

The role of personality traits is defined as primary and formative in the present study [12]. In other words, concern can either play a role in increasing human susceptibility to mental disorders and anxiety, or it can act as a protective factor against these disorders [13]. Due to the need to understand university students' stress levels as much as possible through the Big Five, this thesis is relevant given my goal of providing a better understanding of the stress levels and stress-protective mechanisms in university students. Such knowledge will help better understand how to support interns and provide them with the best stress-protective experience during their internship.

2. Literature Review

2.1. Personality

Personality has been one of the most studied and discussed psychological concepts throughout history. Notably, one of the most acknowledged ways of dividing individuality into types proposed by psychologists is OCEAN or Big Five [14-16]. Researchers identified a set of five concepts, or major dimensions, into which all kinds of personalities can be divided. The first factor is extraversion which reflects the idea of a person who is sociable, assertive, and requires high levels of energy. The second dimension is agreeableness which reflects the concepts of kind, cooperative, and empathetic individuals. Conscientiousness is another personality trait that stands for the profile of a reliable, careful, and controlled person. Some researchers suggest that this concept could also include traits such as the desire to work hard, achieve, and persist in these matters. The next concept is neuroticism, which stands for an ability to withstand stress, low and high spirits. Individuals exhibiting high neuroticism tend to approach problems slowly and ultimately succumb despair. Openness is the final alternate individual standpoint in this paper. Openness stands for an imaginative, receptive to new ideas, and curious person [15, 17-19].

The differences in the five major personality traits have also been noted to have a significant impact on the stress and anxiety of students in their preparation and internship experiences. Previously, the Big Five have been demonstrated as a powerful, rigorous, and truly helpful model for understanding the relationships and individual differences in human behaviors, thoughts, and emotions [20]. While the Big Five personality traits have been used to consider for understanding various aspects of university student life, including contributing to increased understanding of characteristics and behavior, predicting academic success [20, 21] career adaptability [22] social and emotional adjustment [23] and overall health of university students [24] gap exists in our understanding of how these traits specifically influence stress and coping mechanisms during internships. Internship programs provide a unique environment that combines academic preparation with real-world work demands, potentially leading to stress factors not encountered in traditional educational settings [9].

2.2. Internship Stress

Internship stress can be conceptually understood through the lens of an individual-environment interaction [25] where it is defined in terms of students' perceptions and responses to the demands of the work setting [26]. Moreover, recent research, such as Mensah, et al. [27] and Azila-Gbettor, et al. [28] has further conceptualized it as psychological and physical discomfort and the pressure accruing from their involvement in the work during their professional placements.

Today's college and university students experience a range of academic stress that typically involves a lack of time management, financial limitations, contradictions with personal goals and educational standards, social dimensions, and problems assimilating into the academic community [29]. Internships, as imitations of the real professional working space, not only serve as irreplaceable special activities that mirror today's societal expectations but also introduce additional stressors to the learning process, adversely impacting learning and information assimilation [30]. Significant research has documented the adaptability of interns across various scientific spheres, including health, engineering, and helping professions [5, 28, 31]. Interns often feel stressed due to challenges in managing everyday tasks, achieving higher ranks with increased responsibility, and navigating negative social or self-relationships with bosses or co-workers [32]. Limited information and external stress, or aggression, in the workplace further contribute to this stress [33]. Moreover, it has been proven that university students exert effort to achieve the highest-grade point average (GPA), as this can help secure well-paid and suitable jobs in the future, even if it leads to overwhelming stress [34, 35]. For instance, studies have correlated an increase in GPA with rising stress levels among medical students, particularly due to factors such as limited clinical exposure and disruptive impacts of the pandemic on both learning and career prospects [36]. Therefore, it could be hypothesized that:

Hypothesis 1: In terms of internship stress, there would be a difference between GPAs.

The decline in human mental health has been a concerning issue, and personality has been an obvious factor that could significantly affect health-related behaviors and a person's evaluation of their stressful experiences [37, 38]. Researchers mentioned personality traits as a significant factor that generates both positive and negative effects when individual face

issues that could be detrimental to their mental health or contribute to exhaustion. On the one hand, these traits might make individuals more vulnerable and anxious. On the other hand, personality traits could also serve as a protective buffer against poor health outcomes [13].

Many previous studies have shown a close relationship between the personalities of students and internship-related stress. Internship stress experienced by students was related to personal factors, stress-inducing work conditions, and vulnerable personality traits (or neuroticism), which was an important predictor of internship stress levels in women [39].Individuals characterized by higher levels of extraversion typically handle stress better with positivity and sense of control [40-42]. Young extroverts find social support helpful, while older ones rely on experience and coping skills [43, 44]. Lack of decisiveness and negative thoughts about post-university career choices might hinder students' career planning, motivation, and mental health [45]. A study measuring the level of anxiety among student interns found that anxiety about internships could lead to self-doubt and doubts about one's own abilities, worries about how to interact with superiors, and concerns about the scope of work and job environment [6]. The degree and manner in which the work environment affects a person's exhaustion and mental health might depend to some extent on that individual's personality [13]. Moreover, authors have also found the important predictive role of Conscientiousness in susceptibility to stress, especially when it co-occurs with high levels of neuroticism and low levels of extraversion [46]. The relationship between personality and susceptibility to stress had an impact on job performance Doherty and Nugent [47]. Savickas [48] suggested that career adaptability is rooted in personality traits (e.g., proactive personality) [48-50] and this career adaptability was related to improved performance, coping skills, and ability to work under pressure for student interns [51, 52]. Therefore, we can formulate the following hypothesis:

Hypothesis 2: Big five traits would influence internship stress.
Hypothesis 3: Age would moderate the relationship between extraversion and internship stress.

2.3. Stress Mindset Measure for Internship

While stress can cause harm, some studies suggest it can also foster growth and success [53, 54]. It's one of four concepts inspired by the term "eustress," which refers to handling stress for beneficial effects rather than simply avoiding or reducing it [55]. However, it suggests that researchers have focused on the concept of stress mindset, or rethinking stress. A stress is enhancing mindset leads to better health and success, while a stress-debilitating mindset has the reverse impact [56]. These individuals held various assumptions about stress, including their beliefs about how stress affected various aspects of their lives, such as performance, productivity, health, sustainability, and development [57]. This mindset is a major determinant of emotional symptoms and performance in the face of adversity.

Given that many other factors were at work, prior studies suggested that longer internship hours negatively correlated with stress mindset [58, 59]. Sleep deprivation and the feeling of being overwhelmed in a physiological and psychological sense are two factors that contribute to a negative mindset [60-62]. Moreover, psychology and age dimensions were associated with high levels of stress. Female and younger interns were more prone to psychological distress. Specifically, first-year interns had a higher arousal of stress, anxiety, and depression than second-year interns [63]. Furthermore, there were clear gender differences in stress [64]. Usually, women are more likely to have an internalized response to stress, and men are more likely to have an external one [65]. In the aspect of academic performance, students with better academic performance were growth-oriented toward internship stress experiences. To be specific, high-GPA students viewed challenges as opportunities for growth. Meanwhile, with a lower GPA, the mindset was more fixed [66]. They believed past problems with academics were due to limited skills. This suggests a potential link between several variables and stress mindsets within the internship context:

Hypothesis 4: The stress mindset would fifer between genders.
Hypothesis 5: Internship hours would influence stress mindset.
Hypothesis 6: There would be a difference between genders in stress mindset.
Hypothesis 7: There would be a difference between GPAs in stress mindset.

Personality traits such as neuroticism, openness, and conscientiousness regulated the extent of changes in stress-coping attitudes over time during health education courses for student interns [67]. Emotional stability has played a pivotal role in how individuals perceive and manage stress. Those with higher emotional stability exhibit better stress management skills, enabling them to navigate challenging situations more effectively. Furthermore, openness to experience has an inverse effect on primary stress appraisal, with conscientiousness having a positive influence [68]. Extraversion, while linked to increased engagement in academic activities, may also lead to higher levels of both physical and psychological strain [69]. Conscientiousness, agreeableness, and neuroticism were significant determinants of college students' perception of study stress, with conscientious and agreeable students perceiving less stress and neurotic students perceiving more [70].

Hypothesis 8: Big five traits would influence stress mindset.
Hypothesis 9: Internship stress would mediate the relationship between big five traits and stress mindset.

Continuous nurturing of young people's learning and working efforts is crucial in Vietnam, as it is a developing country. Students who have interned in Vietnam, however, frequently face limitations in internship resources, such as a strict education system, a lack of internship facilities, a shortage of dedicated mentors, and inadequate soft skills to cope with internship stress. Despite its significance, research on the relationship between individual personality, internship stress, and stress awareness among Vietnamese students has been scarce. Because there is no clearly defined regulatory framework, student internships in Vietnam still have numerous deficiencies and limitations. Therefore, research on the current status of student internships, particularly regarding stress, is still in its infancy. The majority of current research on stress in the context of student internships in Vietnam is narrow, primarily concentrating on stress perception and coping

strategies, while neglecting the concept of stressful thinking. Our study aims to fill this research gap by exploring the relationship between individual personality, internship stress, and stress mindset measures for internships among Vietnamese students.

In conclusion, this study investigates how personality traits (Big Five), demographics (gender, age, internship hours, GPA), and stress mindsets interact with internship stress. By examining these factors, we aim to understand how they contribute to or alleviate stress for students. This knowledge can be used to refine student support mechanisms and tailor internship programs for a more positive and enriching experience. Ultimately, the goal is to foster student well-being and maximize the benefits of internships during this crucial transition.

3. Methods

3.1. Research Analysis

The study used a quantitative research design to examine the linkage between variables in a cross-sectional study. Once the data was collected, it was first organized, coded, and cleaned using Microsoft Excel. Moreover, it was analyzed using the Statistical Package for Social Sciences version 26.0. We presented descriptive statistics for the participant demographics.

The study assessed the normality of the data by using the Z score. You can calculate the Z scores for skewness and kurtosis by dividing the skewness and kurtosis values by their respective standard errors [71]. From the results, the Z scores for skewness ranged from -2.209 to 0.022, and kurtosis scores ranged from -1.465 to 2.537. These values indicate a normal distribution of the data. Sample distribution is normal when the sample size is between 50 to 300, and the absolute values are between -3.29 to 3.29 [72]. Furthermore, we used independent-sample t-tests to examine and compare two groups, and one-way ANOVAs to see and compare factors with three or more categories.

We adopted the PLS-SEM approach [73] to test he study hypotheses and develop the interactions among the variables. The SmartPLS 4 software was used to analyze the collected data because it is an appropriate tool for reflective measurement models, multiple independent-dependent relationships, moderation and mediation scenarios, and non-normal data [74, 75].

In compliance with thorough disclosure of common practice rules defined by Hair, et al. [74] to establish the measurement models and the structural models, the researchers scrutinized the multiple steps. First, the measurement model was tested, which included the outer loading of indicator reliability, Cronbach's alpha, composite reliability, and convergent and discriminant validity index. The following are the collinearity index, R^2 value, f^2 value, significance and relevance of path coefficients, and many other indexes involved in the extensive PLS-SEM analysis with 5000 bootstrap samples.

3.2. Research Population

This study employed a convenience sample of Vietnamese students studying at a university in Vietnam, recruited through an online survey administered via Google Forms, to explore their internship experiences and associated stress levels.

The researchers undertook data collection over an extended period from March 9 to September 3, 2023. The researchers were informed the participants about the anonymity condition of the survey, guaranteeing the complete confidentiality of their identities and the voluntary nature of their participation without any remuneration. Participants also had the right to withdraw from the study at any stage for any reason.

The questionnaire translation process employed conceptual methods. To initiate this, a native Vietnamese speaker proficient in English translated the English version into Vietnamese. It's crucial to recognize that a literal translation may not always encompass the intended health concepts for measurement. Hence, the authors meticulously reviewed each question to guarantee that the translations precisely conveyed the intended concepts [76].

We established the sample size for our study based on guidelines that recommended a range of 100 to 200 observations, a threshold considered optimal for path estimate analysis investigations [77]. In the beginning, a convenient sampling method was utilized to select participants. In accordance with Osborne [78] recommendations, we subsequently screened and cleansed the data. Outliers and response patterns that failed to satisfy the predetermined criteria were detected and eliminated.

The identification of dubious response patterns was contingent on the ability to categorize the provided answers as alignment marks, order markings, or inconsistencies, specifically in comparison to the reversed item.

The study resulted in the sending of total of 359 questionnaires. Out of these, 121 (33.7%) were filled by students who were not engaged in an internship, while the remaining 238 (66.3%) were completed by participants who had undergone internship programs.

The study employed data from people who participated in internship programs. After applying filters to eliminate incomplete or inconsistent responses, a total of n = 149 valid questionnaires remained for analysis. The return rate of 62.6% surpassed the minimum response rate of 30% typically required by researchers for analysis [79]. The age of the participants ranged from 18 to 32 years, with a mean (M) of 21.48 and a standard deviation (SD) of 1.34. The participants came from different universities and had different fields of study, but they all participated in internship programs Table 1 presents the demographic characteristics of the participants.

Table 1.
Demographic characteristics.

Variable	Total (n = 149)	KCSI		SMMS	
	Frequency	Mean ± SD	p	Mean ± SD	p
Gender					
Female	111 (74.5)	2.87 ± 0.77	>0.05	3.05 ± 0.58	<0.05
Male	38 (25.5)	2.83 ± 0.92		3.29 ± 0.57	
GPA					
2.00 – 2.49	11 (7.4)	3.17 ± 0.46	<0.05	2.71 ± 0.50	<0.05
2.49 – 3.19	47 (31.5)	2.89 ± 0.79		3.10 ± 0.60	
3.20 – 3.59	60 (40.3)	2.96 ± 0.79		3.08 ± 0.60	
3.60 – 4.00	31 (20.8)	2.49 ± 0.88		3.30 ± 0.59	

3.3. Ethical Aspects

This study was granted ethical approval by the Ethical Committee of the Department of Science and Technology at Ho Chi Minh City University of Education, Vietnam (Ref. No. CS.2023.19.10ĐH). The current research study also abided by the ethical principles stated in the Declaration of Helsinki [80] and adhered to the guidelines established by the American Psychological Association [81] for conducting research involving human participants. We carefully adhered to these ethical guidelines to conduct the research in accordance with established ethical standards. The primary objective was to protect the well-being, rights, and privacy of all individuals involved in the study.

3.4. Research Instruments
3.4.1. The Big Five Inventory (BFI)

John, et al. [82] created the Big Five Inventory Scale while working on their investigation of the Five-Factor Model. This scale consisted of 44 items, each measured on a 5-point Likert scale with values ranging from "disagree strongly" to "agree strongly" (α = .86). The scale measured the Big Five personality traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism. Each measure contained carefully developed items that allowed assessing individual facets of each trait to provide a detailed understanding of the respondent's personality. The Big Five Inventory Scale has been validated by numerous studies and is used in academic as well as non-academic settings for personality trait measurement. The combination of simplicity, comprehensiveness, and solid scientific basis makes it one of the most trusted and widely used personality assessment tools.

3.4.2. The Korea Career Stress Inventory (KCSI)

The Korea Career Stress Inventory is a survey instrument composed of 20 items designed to assess levels of stress related to career decision-making among Korean college students. The scale was developed by Choi, et al. [33] using a 5-point Likert scale, which ranges from "totally disagree" to "totally agree," producing internal consistency reliabilities from .83 to .89. The basis of the tool in theory is the understanding that making a career choice can produce great stress in the conditions of contemporary society, and the aim is to distinguish major types of career stress experienced by college students. The authors of the tool constructed the assessment in order to test different areas of the phenomenon, namely, ambiguity, lack of information, employment pressure, and external conflict [33]. However, we decided to apply the KCSI as a whole rather than separate it into subsumed factors to gain a better understanding of the overall level of stress. This approach helps avoid the isolation of particular stress factors and allows us to look at the general phenomenon from a wider angle.

3.4.3. Stress Mindset Measure–Specific (SMM-S)

A short 8-item questionnaire called on the Stress Mindset Measure-Specific (SMM-S) assesses an individual's cognitive mindset towards stress. Developed by Crum, et al. [56] the scale utilizes a 5-point Likert scale ranging from "strongly agree" to "strongly disagree," with Cronbach's α = .86. The theoretical basis of the SMM-S scale is that an individual's mindset towards stress can significantly affect their stress response. The scale crafts its items to assess an individual's belief system about stress and its influence on their emotions and performance. Individuals with a positive stress mindset were inclined to view stress as an opportunity to learn, grow, and enhance their performance, whereas individuals with a negative stress mindset see stress as a threat and are believed to cause a decline in performance [56].

4. Results
4.1. Model Specification

The PLS-SEM model was developed to examine the association between Big Five, mindset stress, and internship stress among college students engaged in an internship program. Figure 1 visually depicts this relationship. The model contains five discrete latent constructs, namely Extraversion, Neuroticism, Conscientiousness (including items from the Big Five Inventory - Forty-four-Item Scale), Mindset Stress (including items from the Stress Mindset Measure - Eight-Item Scale), and Internship stress (including items from the Korean College Stress Inventory - Twenty-Item Scale).

4.2. Measurement Model (Outer Model)

The analysis's outer model is defined by the factor loadings that account for the reliability of the particular offending measurement and assess whether it measures the particular construct. In other words, it was crucial that all factor loadings be above the .70 threshold demarcation line [83]. Nonetheless, it may be mentioned that items below the aggregation .70 limit were nevertheless utilized in this survey since the reliability of these constructs met the acknowledged criteria [83]. We computed two measures of the dependability of all constructs within the model: the Cronbach alpha and the CR. The Cronbach alpha results ranged from .69 to .93; hence, it is adequate in an exploratory evaluation [84] and CR was over.70-demarcation line [85]. Therefore, the reliability criteria were satisfied for all five constructs. The AVE values were above the .50-demarcation threshold in this survey [83]. Nevertheless, it should be borne in mind that the AVE value below .50 can be perceived if the CR is above .60, as advised by Fornell and Larcker [86] that value can still be perceived as bearable if the CR exceeds .60. The convergent validity was also supported by our discoveries, as including all constructs and their characteristics items showed to bear subsistence and assess adequately. Table 2 presents a comprehensive depiction of the outcome coefficients.

Table 2.
Outer loadings, AVE, Cronbach's α, and CR.

Constructs and items	Outer loadings	AVE	Cronbach's α	CR (rho_c)
Conscientiousness_ big five inventory (C_BFI)	-	0.357	0.696	0.792
C_BFI13	0.590	-	-	-
C_BFI18	0.528	-	-	-
C_BFI23	0.707	-	-	-
C_BFI03	0.691	-	-	-
C_BFI33	0.471	-	-	-
C_BFI43	0.582	-	-	-
C_BFI08	0.576	-	-	-
Extraversion_ big five inventory (E_BFI)	-	0.376	0.726	0.778
E_BFI1	0.531	-	-	-
E_BFI11	0.685	-	-	-
E_BFI16	0.498	-	-	-
E_BFI21	0.740	-	-	-
E_BFI31	0.711	-	-	-
E_BFI36	0.453	-	-	-
Neuroticism_ big five inventory (N_BFI)	-	0.519	0.812	0.862
N_BFI14	0.653	-	-	-
N_BFI19	0.699	-	-	-
N_BFI24	0.491	-	-	-
N_BFI29	0.852	-	-	-
N_BFI39	0.860	-	-	-
N_BFI4	0.700	-	-	-
The Korea career stress inventory (KCSI)	-	0.447	0.934	0.941
KCSI1	0.654	-	-	-
KCSI10	0.674	-	-	-
KCSI11	0.535	-	-	-
KCSI12	0.688	-	-	-
KCSI13	0.709	-	-	-
KCSI14	0.654	-	-	-
KCSI15	0.744	-	-	-
KCSI16	0.560	-	-	-
KCSI17	0.745	-	-	-
KCSI18	0.704	-	-	-
KCSI19	0.557	-	-	-
KCSI2	0.664	-	-	-
KCSI20	0.700	-	-	-
KCSI3	0.676	-	-	-
KCSI4	0.711	-	-	-
KCSI5	0.646	-	-	-
KCSI6	0.691	-	-	-
KCSI7	0.668	-	-	-
KCSI8	0.714	-	-	-
KCSI9	0.627	-	-	-
Stress mindset measure-specific (SMM-S)	-	0.520	0.685	0.810
SMMS1	0.576	-	-	-
SMMS3	0.730	-	-	-
SMMS5	0.733	-	-	-
SMMS7	0.821	-	-	-

Note: AVE: Average variance extracted; CR: Composite reliability0.

The Heterotrait-Monotrait Ratio of Correlations (HTMT) is a smart method introduced by Henseler, et al. [87] to assess the discriminant validity. A proposed threshold of HTMT .85 was suggested for each pairwise construct, followed by the validation of the discriminability of the reflective model [87]. Table 3 presents the validation results for the HTMT values. Therefore, this model follows the HTMT standards.

Table 3.
Heterotrait-Monotraitratio of correlations.

Constructs	C_BFI	E_BFI	N_BFI	SMMS	KCSI
C_BFI					
E_BFI	0.528				
N_BFI	0.446	0.436			
SMMS	0.386	0.299	0.663		
KCSI	0.482	0.374	0.467	0.598	

Note: C_BFI: Conscientiousness_The big five inventory; E_BFI: Extraversion_The big five inventory; N_BFI: Neuroticism_The big five inventory; SMMS: Stress mindset measure; KCSI: The Korea career stress inventory.

4.3. Structural Model (Inter Model)
4.3.1. VIF
Multicollinearity is a critical issue in the structural model that should be considered. The Variance Inflation Factors (VIFs) of the variables included in the model exhibited a range of values between 1.006 and 1.266, which falls within an acceptable range. Therefore, we did not consider the presence of collinearity to be a serious concern [74].

4.3.2. β
Based on a 5000-bootstrapped sample methodology to assess the structural models by computing coefficients beta (β), R^2, f^2, and Q^2 [83]. Table 4 describes the findings of the structural model assessment.

The hypothesis proposes that neuroticism negatively influences stress mindset with the result of the study (β = −.361, 95% CI [-.509, -.195], t = 4.523, p < .001). Similarly, internship stress negatively influences stress mindset, with the findings (β = -.330, 95% CI [-.474, -.198], t = 4.679, p < .001). Furthermore, internship hours negatively influence stress mindset (β = -.169, 95% CI [-.285, -.044], t = 2.736, p < .01). In the context of internship stress, the Big Five personality qualities of conscientiousness and extraversion were shown to have a statistically significant negative influence on it, according to the analysis conducted (β = −.283, 95% CI [-.418, -.162], t = 4.284, p < .001) and (β = -.205, 95% CI [-.355, -.085], t = 2.944, p < .01), in that order. In contrast, neuroticism exhibits a notable positive influence on the level of stress experienced during internships, as evidenced by the regression coefficient (β = .294, 95% CI [.150, .424], t = 4.269, p < .001).

Table 4.
Paths coefficient.

Paths	β	95% CI lower	95% CI upper	*p*
Direct effects				
C_BFI → KCSI	-0.283	-0.418	-0.162	< 0.001
E_BFI → KCSI	-0.205	-0.355	-0.085	< 0.01
N_BFI → KCSI	0.294	0.150	0.424	< 0.001
KCSI → SMMS	-0.330	-0.474	-0.198	< 0.001
N_BFI → SMMS	-0.361	-0.509	-0.195	< 0.001
Gender → SMMS	-0.292	-0.572	-0.018	< 0.05
InternshipHours/Week → SMMS	-0.169	-0.285	-0.044	< 0.01
Age x E_BFI → KCSI	-0.168	-0.309	-0.022	< 0.05
Indirect effects				
E_BFI → KCSI → SMMS	0.068	0.027	0.124	< 0.01
N_BFI → KCSI → SMMS	-0.097	-0.172	-0.042	< 0.01
C_BFI → KCSI → SMMS	0.093	0.042	0.170	< 0.01

Note: C_BFI: Conscientiousness_the big five inventory; E_BFI: Extraversion_the big five inventory; N_BFI: Neuroticism_Thebig five inventory; SMMS: Stress mindset measure; KCSI: The Korea career stress inventory.

4.3.3. F^2
We use the effect size (f^2) criterion used to evaluate how eliminating a particular predictor construct on the R^2 value of an endogenous construct [83]. Based on Cohen [88] f^2 values can be divided into three different categories: .02 to .14, .15 to .34, and .35 and above, which represent small, medium, and high effect sizes, respectively. The internship stress's effect size on stress mindset (f^2 = .147, p = .036), shows a small impact size.

4.3.4. R^2
The coefficient of determination (R^2) holds significant importance as a criterion for assessing the efficacy of structural models through the PLS-SEM model. The R^2 adjusted values indicated that internship stress explained 34.0 percent of the variance, and stress mindset explained 39.8 percent of the variance.

4.3.5. Q^2

The predictive relevance (Q^2) values for internship stress and stress mindset are .288 and .262, respectively, showing the model's predictive significance. Moreover, when plenty of indicators in the PLS-SEM analysis had higher the naïve LM benchmark compared to RMSE values, this finding provides additional evidence to support the model's robust predictive potential [89]. This suggests that the model constructs have exhibited predictive capability.

4.4. Mediation and Moderation Analysis

Table 4 suggests that there was a mediating effect of internship stress on the association between neuroticism (β = -.097, 95%, CI [-.172, -.042], t = 2.861, p < .01), conscientiousness (β = .093, 95%, CI [.042, .170], t = 2.835, p < .01), extraversion (β = .068, 95%, CI [.027, .124], t = 2.701, p < .01) and stress mindset. In addition, we tested age as a moderating variable in the relationship's extraversion to internship stress (β = -.168, 95% CI [-.309, -.022], t = 2.296, p < .05).

4.5. Comparison Test

In the present study, a statistically significant difference was seen between gender and stress mindset ($t_{(147)}$ = 2.276, p < .05). Specifically, female students (M = 3.05, SD = .58) exhibited a lower tendency to cope with stress compared to their male counterparts (M = 3.29, SD = .57). In addition, there was a significant difference between GPA and internship stress ($F_{(3,145)}$ = 3.25, p < .05), Individuals who have a low GPA experience greater levels of "internship stress" compared to individuals with a good GPA. Moreover, there was a significant difference between GPA and stress mindset ($F_{(3,145)}$ = 2.91, p < .05), Students with high GPA scores also have high "stress mindset" scores.
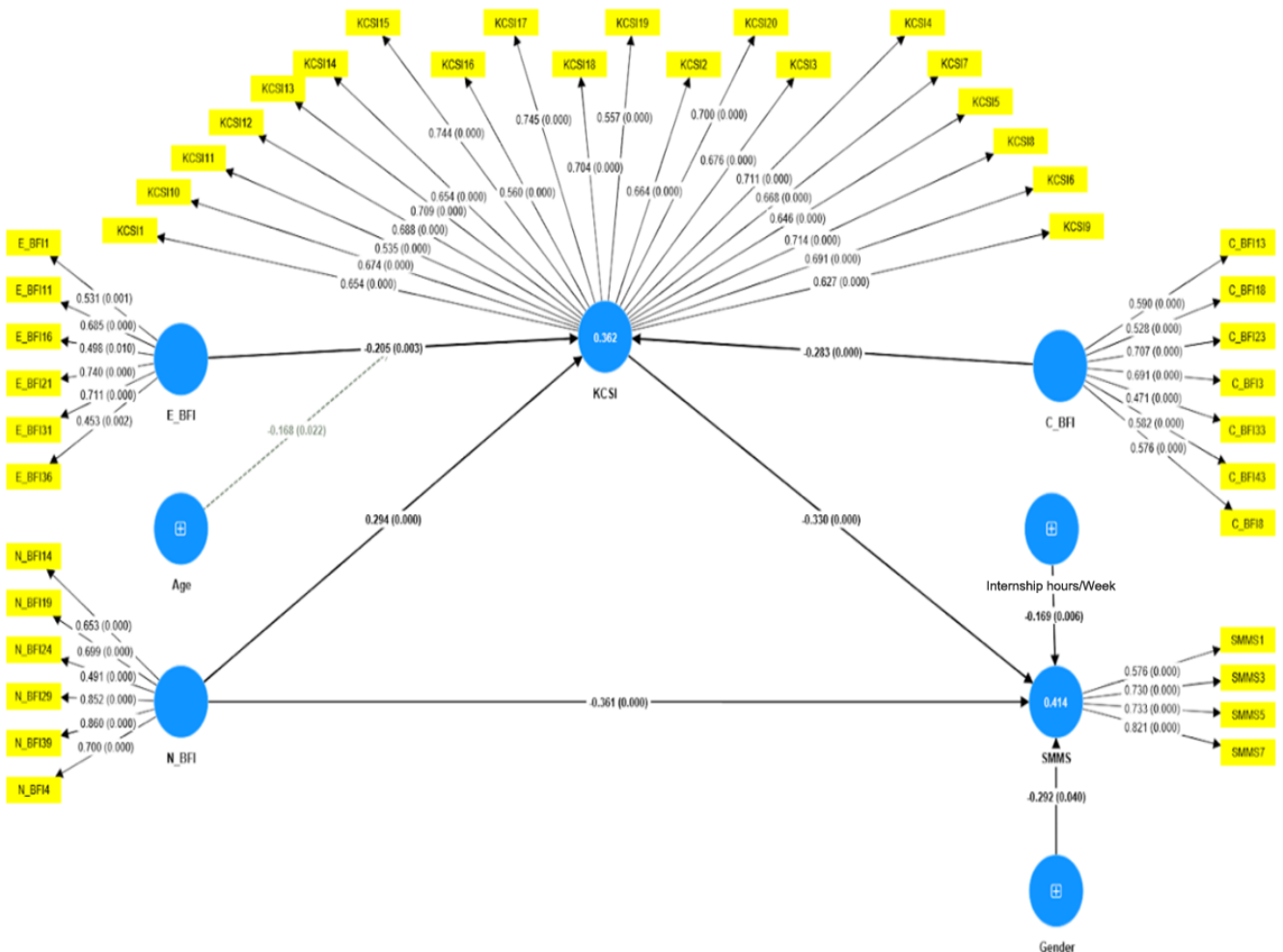

Figure 1.
Partial least squares structural equation modeling (PLS-SEM).
Note: C_BFI: Conscientiousness_the big five inventory; E_BFI: Extraversion_the big five inventory; N_BFI: Neuroticism_the big five inventory; SMMS: Stress mindset measure; KCSI: The Korea career stress inventory; Age; Internship hours week; Gender.

5. Discussion

The study examined the direct and indirect impacts of personality in the Big Five, internship stress, and stress mindset among Vietnamese students. It also investigated gender and GPA differences. In Vietnam, internships receive insufficient attention. This study contributes to understanding key internship variables, emphasizing their significance in transitioning from student to employee. It offers implications and theoretical/practical advancements for consideration.

5.1. The Relationship between Neuroticism, Internship Stress and Stress Mindset

Our study has revealed a connection between neurotic traits and internship stress. Students with higher levels of neuroticism, as defined by the Big Five model, have experienced greater stress throughout their internships. This aligns with the established characteristics of neuroticism. Individuals high in neuroticism tend to struggle with emotional regulation, are more likely to experience negative emotions [90] and therefore may react more intensely to stressors [91].

Researchers have also discovered a negative correlation between internship stress and a stress mindset. When interns process a lot of new information and perform unfamiliar tasks, this cognitive overload can lead to increased stress. As stress levels rise, it becomes more challenging to maintain a positive stress mindset [92]. This elevated stress can be detrimental, affecting overall well-being and internship performance [93]. As a result, high stress can lead to the inability to prove or confirm abilities and cause people to see stressful situations as obstacles rather than learning opportunities. Students may recognize the harm of stress and form stress-is-debilitating approach. Secondly, according to Woo, et al. [94] students view their colleagues and peers as opponents, which can contribute to the cultivation of stress-is-debilitating paradigm. Finally, Lee [95] suggests that some students may not have learned coping mechanisms to deal with stress. In this way, poor coping intensifies the trauma of stress-is-debilitating approach. Therefore, stress-is-debilitating approach to the internship can increase stress and make interaction even more challenging.

However, neurotic individuals may interpret challenges or difficulties that other view as manageable or normal as extremely stressful, potentially leading to depression and anxiety [96]. This has had negative consequences for their personal and professional growth [70]. Students high in neuroticism also tend to develop stress-is-debilitating mindset. They frequently worry excessively [97]. When faced with internship challenges, they are more likely to ruminate on negative outcomes, dwelling on thoughts like "What if I fail?" This rumination can increase their stress and anxiety [98]. That is consistent with our finding that neurotic students negatively interact with stress mindsets and tend to possess stress-is-debilitating mindset.

Taken together, all of the most compelling above explanations support our intriguing finding that internship stress mediates the association between neuroticism and stress mindset. Students high in neuroticism experienced more internship stress and were more likely to develop stress-is-debilitating mindset. This neuroticism led to increased stress which in turn contributed to a negative view of stress.

5.2. The Relationship Between Extraversion, Age and Internship Stress

Our research aligned with previous work, which indicated a negative correlation between extraversion and internship stress.Extraversion is defined by the presence of positive emotionality, friendliness, and assertiveness. It also indicated an inclination towards sociability, enthusiasm, assertiveness, and a desire for stimulating experiences, which is one potential explanation for the negative correlation between extraversion, stress and anxiety [99]. Students who possessed extraversion traits tended to acquire knowledge and seek guidance from others, so they experienced reduced levels of stress and adaptive ambiguity, which is identified as one of the contributing elements to the experience of stress during internships [100]. Similarly, people who possessed higher levels of extraversion had larger social networks [101]. It was more natural for them to figure out sources of support when they encountered stress during their internship. Additionally, high extroverts demonstrated more robust psychological responses to stress [102]. This includes the report of more positive subjective emotions and more intense feelings of control in stressful situations [40-42].

Nevertheless, our findings provided evidence that age moderated the association between extraversion and internship stress in students. This means that the effect of extraversion on internship stress could have differed from one student to another based on their age difference [103]. In the context of this study, age could vary depending on the individual's level of experience with internship programs. Several factors substantiated the possibility of age acting as a moderating variable. Younger participants who are high in extraversion might show increased levels of effort to engage in social interactions and novel experiences [43, 104]. It is possible that the close relationships developed with fellow students and supervisors might have reduced stress among individuals [44]. Otherwise, as students move through college, their age-based life stages change, allowing them to grow and develop in new ways. Furthermore, older students might have accumulated certain amounts of internship experience in the past [105, 106]. This would boost their confidence in handling work-related stressors and mitigating other causes of internships. In addition, personality traits tend to become more stable with age, and extraversion, being a personality trait, is likely to become relatively consistent over time [107]. This stability could have made the relationship between extraversion and internship stress less pronounced among older students.

5.3. The Influence of Conscientiousness and GPAs on Internship Stress

As anticipated, this study investigated the negative correlation between conscientiousness and internship stress. Individuals with high conscientiousness tended to exhibit personality qualities like discipline, carefulness, and diligence. These attributes were advantageous during internships, contributing to a decreased likelihood of experiencing stress. Previous studies investigated the relationship between conscientiousness and stress in internships, suggesting that conscientiousness played a protective role [108]. Higher conscientiousness scores in interns were correlated with lower stress levels [70] supporting our findings. Typically, people with conscientious traits might have recovered more effectively from negative emotions during internships [109], potentially improving their psychological well-being even under stress [46]. These individuals often engaged in planning and prioritizing, which could have decreased the occurrence of stressors [110, 111].

Personality is not the only discovered factor that influenced stress mindset, it was also GPA. Previous research by Bozyiğit and Gökbaraz [112] and by Çetinkaya [113] also claimed these results. The GPA showed a significant difference

among students' scores, confirming that students with GPAs of 2.00-2.49 have a higher mean score on internship stress than their peers. The use of this research to support this fact is relevant, as students with lower GPAs probably feel a higher level of stress regarding their future career achievements. This might be explained by their difficulties in getting a job or finding a job in a competitive business or sphere. Research from Sun and Zoriah [114] supports the negative correlation between stress and GPA. Another finding from this study was that there is no difference between male and female candidates according to their internship stress. Previous researchers also suggested these findings [112, 113].

5.4. The Influence of Internship Hours, GPAs, and Gender on Stress Mindset

Several previous studies supported our finding that internship hours significantly impacted interns' stress mindset. Many studies have focused on the relationship between working hours and stress mindset and have suggested that long working hours could have a negative impact, providing evidence for our findings. Employees who worked longer hours were associated with a higher level of perceived stress [58, 59]. Similarly, the increased number of internship hours may have influenced the intern's stress mindset by making it more negative. Additionally, physiological and psychological explanations could explain the negative impact of more internship hours on the stress mindset. The physiological impact of longer working hours included negative health outcomes such as sleep deprivation and fatigue, which could increase the impact of stress and make stress perception more negative [60, 61]. Meanwhile, time pressure could affect an intern's psychological adjustment in the form of stress and burnout [62]. Such a negative appraisal would hinder their ability to respond positively to the internship demands and would multiply negative stress-related outcomes.

Moreover, the results indicated a significant difference between male and female students concerning their stress mindset. Specifically, male students had higher mean scores compared to their female counterparts. These findings align with previous research, such as the study conducted by Zhang [64] which reported similar trends in the context of stress mindset measurement. The results also revealed a significant difference among students' GPA scores. Notably, students with GPA scores in the range of 3.60-4.00 had higher mean scores on the stress mindset than their peers with different GPA ranges. These findings are in accordance with earlier research, such as the study conducted by Suldo, et al. [66] which also reported similar patterns regarding stress mindset measurement.

6. Implications

Our research expands the understanding of personality traits, internship stress, and stress mindset. It contributes to existing literature by addressing the missing issues faced by Vietnamese students during internships, allowing for the development of appropriate stress-coping strategies. Our findings support the established link between Big Five personality traits (neuroticism, conscientiousness, and extraversion) and internship stress [99, 100, 115]. Additionally, we identified a novel moderating effect of age on the relationship between extraversion and internship stress. Furthermore, this study clarifies the mediating role of internship stress in the negative association between neuroticism and stressful thinking.

The internship environment is a crucial concern for students. Students recommend receiving emotional support, encouragement, and a comfortable and interactive environment with teachers [116]. We recommend careful evaluation of the internship environment from the beginning.

It is possible to develop better internship programs for universities and businesses by incorporating the design of these programs among the students and companies simultaneously [5]. In the case of universities, it is highly beneficial for businesses to have a well-structured plan to provide internship opportunities to students. This will help the students understand the job types they will be involved in and prepare to get rid of common confusion and a lack of information shared. To manage the student experience, the intern oversees several activities, like discussing objectives, expectations at the outset, and providing extensive feedback at the end of the program. The program should be tailored to the specific needs of the interns and businesses while fulfilling academic objectives. For business, a better internship program involves a plan designed to help students understand their job and prepare for challenging internships. Establish clear goals and expectations at the beginning, and provide students with feedback at the [5].

The results of the study emphasize the need for the development and implementation of educational programs to manage stress among student interns. Creating schedules, physical activity, and fun activities outside of internship leave opportunities for students to form a stress mindset [117]. To foster the acquisition of coping skills for common internship stressors, intervention programs could be implemented by universities and internships to improve mental health [39, 118]. Universities could develop a supportive learning environment and teach students the necessary skills and optimal stress-coping mechanisms with the help of support instructors and workshops. These measures would grant students the ability to manage stress efficiently and enhance their personal growth. Positive social interactions within a supportive and nurturing environment could likewise lead to a greater mental state of interns [119].

7. Limitations

This study has various constraints. First and foremost, it is crucial to acknowledge that this study is of a cross-sectional nature. Therefore, we must conduct additional comprehensive longitudinal studies to collect data on the factors under investigation. This methodology would produce more extensive outcomes, specifically in comprehending the stress mindset of college students in connection with their internship stress and personality and ascertaining if these findings change over time. In addition, the significant difference in demographic characteristics, exceeding a ratio of 1.5 (e.g., with 38 males and 111 females), greatly reduces the accuracy of comparison tests. Future studies must recognize this limitation and devise techniques to tackle and resolve this issue in order to get more precise analyses and interpretations. Moreover, it is imperative to recognize that this research is carried out within the particular framework of Vietnam. Hence, the results are

limited to specific cultural and geographical contexts, requiring additional investigation to determine their relevance in many situations, including both developing and established nations. Finally, future research should broaden the research framework by including supplementary components, thereby improving the result's applicability.

8. Conclusion

This study investigated the relationships between personality traits (Big Five), internship stress, and stress mindset among Vietnamese students. We also explored the influence of gender, age, and GPA. Our findings aligned with prior research, demonstrating that neuroticism is positively associated with internship stress, while conscientiousness is negatively associated. Age moderated the extraversion-stress relationship, with younger extraverts experiencing lower stress. Internship stress mediated the link between neuroticism and stress mindset. Additionally, lower GPAs were associated with higher stress, and male students reported a more negative stress mindset. These results highlight the importance of personality and internship design in managing student stress. Universities can develop programs that address stress management and involve students in internship design. Businesses should provide clear goals and feedback. Future research should employ longitudinal designs and consider cultural contexts.

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