

## Article

# Perceived Stress and Cyberloafing among College Students: The Mediating Roles of Fatigue and Negative Coping Styles

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**Abstract:** Cyberloafing has increasingly attracted the attention of scholars because of the widespread use of digital devices in educational environments. This research was conducted to investigate the roles of fatigue and negative coping styles in mediating the relationship between perceived stress and cyberloafing. A total of 730 undergraduates (reduced to 716 due to incomplete data) completed self-report questionnaires measuring perceived stress, fatigue, negative coping styles, and cyberloafing. Perceived stress was shown to be a significant predictor of cyberloafing. Furthermore, negative coping styles played a unique mediating role and fatigue and negative coping styles exerted a sequential mediating effect on the association between perceived stress and cyberloafing. We envision the findings as being helpful in guiding educators develop interventions for minimizing cyberloafing by college students and its disrupting effects.

**Keywords:** perceived stress; fatigue; negative coping styles; cyberloafing



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## 1. Introduction

Rapid developments in communication and information technologies have resulted in the Internet playing a significant role in the lives of people today. Although this is beneficial in a number of respects, its misuse can lead to harmful effects [1]. For example, employees may utilize the Internet to engage in nonwork activities during work hours [2], in turn resulting in reduced employee productivity and elevated expenditures for the organizations [1]. Reflecting on the nature of this phenomenon led some experts to propose the term “cyberloafing” [1] as the best descriptor to capture when workers engage in activities unrelated to work during their duty hours. Recently, cyberloafing has been found to adversely affect not only workplaces but educational institutions as well [3], due in large part to the introduction of digital technologies and devices like smartphones, tablets, and laptops into classroom instruction [4]. At present, cyberloafing has also become highly prevalent among college students [5]. For instance, students have been observed to consume major portions of their time in class “fiddling” with their smartphones or other digital products that may not be relevant to what is being taught in class [3,6] (e.g., engaging in surfing news websites, playing online games, etc.) [7]. Thus, the term cyberloafing has been extended to describe any behavior that occurs when using the Internet for activities unrelated to working or studying [1,3,8]. Cyberloafing can lead to multitasking, which in turn reduces a student’s energy, time, and commitment in the class [9], disrupting their learning goals, decreasing their academic performance, and increasing academic procrastination behaviors [3,10]. Given these multiple potential

adverse effects, it is important to examine the risk factors for cyberloafing behavior among college students in educational settings.

Research efforts to identify the causes of cyberloafing have found that certain psychosocial perceptions, attitudes, and learning strategies all can affect the behavior of cyberloafing [6]. Among the causal factors investigated to date, perceived stress has been identified as a primary motivation for individuals to engage in cyberloafing. Moreover, perceived stress is positively associated with the cyberloafing behavior among college students [10] and can also serve as a critical predicting factor for cyberloafing [5,11]. The mechanisms involved in such associations, however, remain unknown. Consequently, this study was undertaken to shed some light on these mechanisms by investigating the potential mediating roles of fatigue and negative coping styles in the association between perceived stress and cyberloafing among college students.

### *1.1. Perceived Stress and Cyberloafing*

Perceived stress refers to the degree of stress experienced by an individual and the level of the effect of this perception on the individual's ability to cope with stressful events [12]. Perceived stress appears to be associated with diverse internet behavior problems [13,14], such as cyberloafing [10,15]. Previous studies have indicated that people with high perceived stress levels are very likely to experience distress and use cyberloafing as a strategy to relieve their negative emotions and manage the stress [16]. Appropriate levels of cyberloafing can replenish the resources utilized in the stressful academic activities of the students, thus facilitating a recovery experience for them [3].

Moreover, college students now report experiencing greater levels of stress than ever before [17]. They often face excessive pressure from family (e.g., concerning finding a job after graduation), social norms, and academic demands (e.g., difficulty of learning, fierce competition among peers for scholarships) [18]. College students who feel heightened stress and accompanying negative affective states may rely on technologies, such as mobile phones or computers, as a means for reducing their negative feelings and overwhelming emotions [19,20]. Based on the above research, we hypothesized that perceived stress would be positively associated with cyberloafing.

### *1.2. Mediating Role of Fatigue between Perceived Stress and Cyberloafing*

Fatigue is a complex state characterized by a lack of alertness, which may in turn lead to decreased mental and physical performance [21]. Stress has the potential to quickly lead one to feel exhausted and experience physical and/or psychological fatigue as cognitive resources become depleted [22]. Several studies have shown perceived stress to be positively correlated with fatigue. For example, Yogisutanti et al. [23] indicated that workers who experience heightened work-related stress became fatigued more easily. In a similar vein, Doerr et al. [24] found that the amount of stress a person experienced the previous day significantly influenced their level of fatigue the following day. Moreover, when individuals are fatigued, they have difficulty focusing on the tasks at hand, making them more prone to distraction, such as engaging in cyberloafing. A cross-sectional study on Iranians found that individual work-fatigue levels significantly influenced cyberloafing activities [25]; the greater the level of fatigue, the more likely a person was to engage in cyberloafing.

It has also been suggested that perceived stress and fatigue are related to cyberloafing, but it is still unknown if fatigue serves as a possible mechanism that relates perceived stress to cyberloafing. The ego depletion model of self-regulation [26] has yielded some insights into the mechanism of the association between these two variables. This theory suggests that cognitive resources are consumed when people find themselves in stressful situations [8], which can lead to fatigue. A previous study revealed that perceived stress might be negatively associated with a person's level of self-control, leading to depletion of one's cognitive resources and accompanying fatigue [27].

Furthermore, fatigue makes it increasingly difficult for learners to direct their available cognitive resources to the most relevant aspects of critical tasks [28], leaving them more susceptible to the temptation of the Internet to deviate from their current study tasks and engage in cyberloafing [29]. Therefore, we expect fatigue to be a mediator between perceived stress and cyberloafing. In searching the literature search, we were unable to find studies that have examined whether fatigue was a mediator in the association between perceived stress and cyberloafing in an educational setting. Drawing upon the ego depletion theory and the limited available research cited above, we hypothesized that fatigue would be likely to mediate the relationship between perceived stress and cyberloafing.

### *1.3. Mediating Role of Negative Coping Styles between Perceived Stress and Cyberloafing*

People experiencing stressful conditions frequently attempt to manage them by adopting negative coping styles (i.e., disengagement, avoidance, or emotion-focused strategies) [30,31]. This is believed to occur as a means for individuals to protect their remaining resources rather than consume them, hence, avoidance and denial [32]. College students often have more negative emotions, which serves to reduce their flexibility of thinking and narrow their cognitive range, leaving them more likely to adopt negative ways to deal with excessive stress and pressure [32]. It is therefore not surprising that perceived stress has been suggested to be positively correlated with negative coping styles [33,34].

In addition, adopting negative coping strategies is possibly a susceptible factor for cyberloafing, with some investigations revealing how a short-run preference for negative coping mechanisms can evolve over the long-run into addictive behaviors [35–37]. Consistent with this view are findings showing negative coping styles to be associated with problematic internet use, pathological gambling, and video game addiction [38–40]. In other words, individuals who prefer negative coping may use the Internet to compensate for negative feelings and thoughts.

Although problematic internet use and perceived stress have been shown to be associated with negative coping styles, it is unclear if negative coping styles serve as mediators between perceived stress and cyberloafing. The theory of conservation of resources (COR) [41] holds that people tend to guard their remaining resources as a way to prevent intense resource-consuming conditions. At the same time, individuals make efforts to compensate for the consumed resources via certain risky behaviors. In this regard, people who experience great levels of perceived stress are more likely to isolate themselves from the pressured conditions by using various negative coping strategies [42,43]. Additionally, the Internet may be a way to mitigate or substitute negative emotions with positive ones, as it is highly functional and convenient and can meet the psychological needs at once. Consequently, certain individuals are likely to be constantly engaged in cyberloafing following any experience of perceived stress. In other words, negative coping strategies are preferred among individuals experiencing perceived stress and may serve as a predicting factor for cyberloafing.

In accordance with the theory of COR, certain individuals experiencing insufficient control over their perceived stress may choose negative coping strategies for escaping the real world [44,45]. Nonetheless, negative coping strategies may induce problem internet behaviors, including cyberloafing, which mitigate the negative emotions in the short run. In this way, negative coping can partially relieve the negative emotions or even generate positive emotions, while having a minimal impact on resource consumption [46,47]. Furthermore, negative coping strategies may play a mediating role between perceived stress and problematic internet use [48]. It has been suggested that cyberloafing represents another form of problematic internet behavior [49]. Therefore, it is rational to suggest that perceived stress may induce negative coping strategies, which in turn could lead to cyberloafing.

However, so far, no existing studies have been found on the direct examination of negative coping styles that serve as a mediating factor between cyberloafing and perceived stress. Therefore, based on the limited theories available and the research findings reported

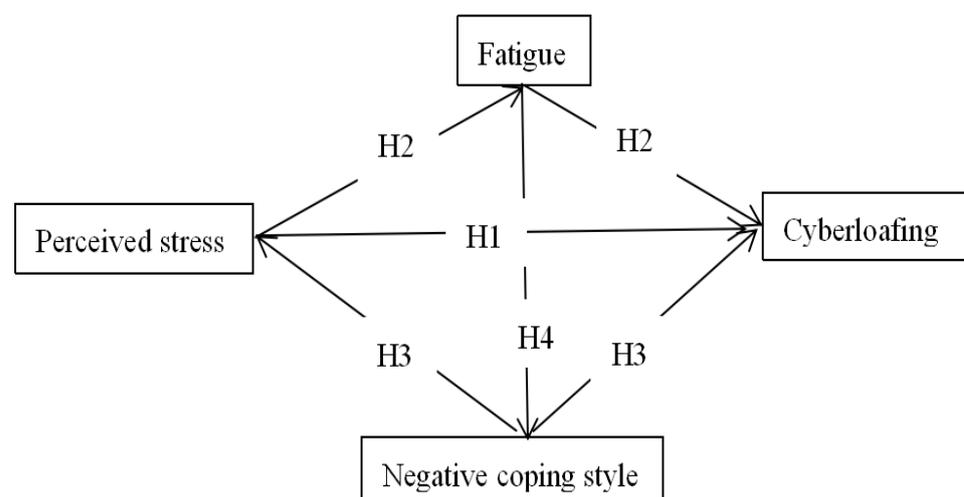
above, we hypothesize that negative coping styles mediate the association of perceived stress and cyberloafing.

#### 1.4. Mediating Roles of Fatigue and Negative Coping Styles

Finally, fatigue may have parallel and series effects on negative coping styles by regulating the association of perceived stress and cyberloafing. For example, college students experiencing higher levels of perceived stress have been found to experience greater fatigue, with severe fatigue engendering negative coping strategies [50]. Specifically, college students who experience high pressure are prone to fatigue; when fatigued, individuals do not possess sufficient “internal resources” to cope with the stressful environments and subsequently adopt negative coping styles to manage the problems and difficulties encountered in the learning environments [51]. Therefore, based on previous research finding, we hypothesize that fatigue and negative coping styles will sequentially mediate the relationship between perceived stress and cyberloafing behaviors.

#### 1.5. The Current Study

According to the above findings, perceived stress has been a main predictive factor for cyberloafing. Perceived stress may exert effects on individual behavior via psychological symptoms or cognitive strategies available. Based on the ego depletion model of self-regulation [26] and the theory of conservation of resources [41], people may feel fatigue when their cognitive resources are consumed in stressful situations and negative coping styles may be adopted to protect their resources. That is, fatigue and negative coping styles can be postulated as potential mediators to elucidate how perceived stress is associated with cyberloafing. Nevertheless, research examining whether perceived stress is associated with cyberloafing via the mediating roles of fatigue and negative coping styles is lacking. Therefore, the current study attempted to shed more light on the mechanisms underlying the association between perceived stress and cyberloafing through a hypothesized mediation model (see Figure 1). The hypotheses below were put forward on the basis of prior research findings:



**Figure 1.** The conceptual model between perceived stress and cyberloafing.

**Hypothesis 1 (H1).** *Perceived stress will be positively correlated with cyberloafing.*

**Hypothesis 2 (H2).** *Fatigue will mediate the association between perceived stress and cyberloafing.*

**Hypothesis 3 (H3).** *Negative coping styles will mediate the correlation between perceived stress and cyberloafing.*

**Hypothesis 4 (H4).** *Fatigue and negative coping styles will mediate the correlation between perceived stress and cyberloafing.*

## 2. Methods

### 2.1. Participants and Procedure

The participants were recruited from three universities within Hubei province, China via convenience sampling. After excluding 15 individuals who failed to respond to 5% or more of the items, 716 undergraduates remained for analysis. The average age of the participants was 20.38 years ( $SD = 2.34$ ), and 58% were female. The sample consisted of 224 first-year students (31.28%), 180 sophomores (25.14%), 184 juniors (25.70%), and 128 seniors (17.88%).

This study was approved by the Research Ethics Committee of China Three Gorges University. Prior to data collection, participants were provided with written informed consent forms, which included a brief description of the research project, informed them that any information provided would be kept confidential with no names recorded, that their responses would be used only for research purposes, and that they were free to discontinue their participation at any time without penalty. The participants were then invited to complete all questionnaires, which were distributed in the same order. The measures were administered and brief biographical data collected by well-trained postgraduate students. The participants took approximately 10 min to complete the questionnaires.

### 2.2. Measures

#### 2.2.1. Perceived Stress

The 14-item Perceived Stress Scale by Cohen et al. [12] was adopted to assess how often the participants' lives were appraised as stressful. The participants were asked to indicate how often they felt or thought about each item during the previous month, using a 5-point scale, where 0 = never and 4 = very often. The following is an example item: "How often in your life do you feel the inability to control important things?" Four items are reverse scored (to guard against bias), with all responses then being summed to yield a total stress score, ranging from 0 to 56, wherein higher scores indicate heightened levels of stress. Cronbach's  $\alpha$  was 0.78 for our administration.

#### 2.2.2. Fatigue

Fatigue was measured by the 14-item Fatigue Scale [52], where seven of the items focus on the "physical symptoms of fatigue" and the remaining seven items inquiring about the "mental symptoms of fatigue." It can be scored in various ways (total score, two separate subscale scores, and items rated on a bimodal versus a four-point Likert scale). We used the bimodal scoring approach, where values of "0" are recorded for items rated as "better or no more than usual" and values of "1" recorded for items rated as "worse or much worse than normal," as this method controls for errors attributed to "end users" and "middle users." When scored in this manner, score values range from 0 to 14, with higher scores indicating greater levels of fatigue. The scale developers reported acceptable reliability and validity for this measure. In this study, the Cronbach's  $\alpha$  was 0.70.

#### 2.2.3. Cyberloafing

Cyberloafing was measured using the 16-item Cyberloafing Scale [53], where responses are rated from 1 (hardly ever; once every few months or less) to 4 (frequently; at least once a day). Score values range from 16 to 64, with higher scores indicating greater cyberloafing. Results from confirmatory factor analyses reported by the authors support the structural validity of this measure ( $\chi^2/df = 3.72$ , RMSEA = 0.06, TLI = 0.89, CFI = 0.93). The Cronbach's  $\alpha$  in this study was 0.78.

### 2.2.4. Negative Coping Styles

The Negative Coping Style subscale of the Coping Style Questionnaire by Xie [54] was used to evaluate the negative coping styles of the participants. This subscale includes eight items that assess the frequency with which people adopt negative coping styles like distraction and avoidance (e.g., “Relieved their worries by smoking, drinking, taking medicine, and eating”). Items are scored from 0 (never used) to 3 (often used), and a greater score indicates a higher frequency of using negative coping strategies. The mean rating for each item was used in all analyses. According to prior studies, the scale has good validity and reliability among Chinese university students [55]. The Cronbach’s  $\alpha$  in this test was 0.71.

### 2.3. Data Analysis

SPSS 25.0 and SPSS macro-PROCESS were used to analyze the data [56]. Descriptive statistics were first examined, followed by computing Pearson’s correlation coefficients to assess the associations among the variables. Finally, PROCESS (model 6) was applied to test the multiple-mediation models that involved fatigue and negative coping styles with the association of perceived stress and cyberloafing.

## 3. Results

### 3.1. Primary Analysis

The mean, standard deviation, and correlation coefficient matrices for all variables are presented in Table 1. After controlling for the variables of gender and age, perceived stress was positively correlated with fatigue, negative coping styles, and cyberloafing. In addition, fatigue was positively correlated with negative coping styles and cyberloafing.

**Table 1.** Descriptive statistics and correlations.

Variables	M	SD	1	2	3	4	5
1. Gender <sup>a</sup>	-	-	-	-	-	-	-
2. Age	20.38	2.34	-	-	-	-	-
3. Perceived stress	2.92	0.45	0.11 **	0.15 **	-	-	-
4. Fatigue	7.67	3.43	0.05	0.10 **	0.50 **	-	-
5. Negative coping styles	1.19	0.51	0.02	0.09 *	0.21 **	0.22 **	-
6. Cyberloafing	2.38	0.49	0.01	0.10 *	0.15 **	0.10 **	0.28 **

*N* = 716. <sup>a</sup> Gender is a dummy variable, female = 1, male = 0, mean represents the proportion of females. \*  $p < 0.05$ , \*\*  $p < 0.01$ .

### 3.2. Testing Multiple Mediation

The Hayes [56] procedure (Model 6) was conducted to test the roles of fatigue and negative coping styles in mediating the association of perceived stress and cyberloafing, with gender and age regarded as control variables. Our analyses revealed the following findings (see Table 2 and Figure 2 for more complete information): gender significantly predicted negative coping styles ( $\beta = 0.15$ ,  $p < 0.01$ ), perceived stress significantly predicted cyberloafing ( $\beta = 0.09$ ,  $p < 0.05$ ). Similarly, perceived stress positively predicted negative coping styles ( $\beta = 0.12$ ,  $p < 0.01$ ), which in turn positively predicted cyberloafing ( $\beta = 0.12$ ,  $p < 0.01$ ). However, fatigue did not predict cyberloafing ( $\beta = -0.01$ ,  $p > 0.05$ ), although perceived stress positively predicted fatigue ( $\beta = 0.50$ ,  $p < 0.01$ ).

To further examine the significance of the indirect effects, bias-corrected bootstrap tests derived with 5000 samples were used. The 95% confidence interval did not contain zero, indicating the findings are statistically significant. As shown in Table 3, Fatigue and negative coping styles had an intermediary role between perceived stress and cyberloafing, with an overall mediating effect of 0.05, making up for 34.11% of the gross effects that perceived stress had on cyberloafing. Specifically, the mediating effect can be divided into the following: indirect effect 1 ( $-0.004$ ), a path through perceived stress  $\rightarrow$  fatigue  $\rightarrow$  cyberloafing; indirect effect 2 (0.02), a path generated by perceived stress  $\rightarrow$  fatigue  $\rightarrow$

negative coping styles → cyberloafing; and indirect effect 3 (0.03), a path generated by perceived stress → negative coping styles → cyberloafing. As observed from Table 3, for indirect effect 1, a 0 value regarding its bootstrap 95% CI was obtained, indicating the absence of statistical significance in the mediating effect of fatigue on perceived stress compared to cyberloafing.

**Table 2.** Regression analysis of variables in the model.

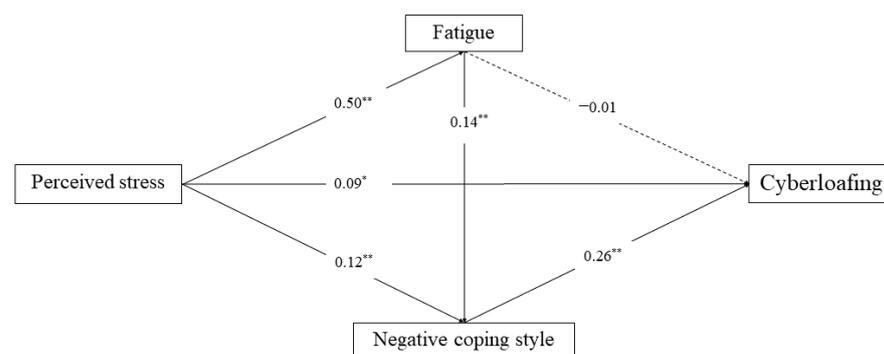
	Equation 1 (DV: Fatigue)		Equation 2 (DV: Negative Coping Styles)		Equation 3 (DV: Cyberloafing)	
	B (Boot SE)	95% Boot CI	B (Boot SE)	95% Boot CI	B (Boot SE)	95% Boot CI
Age	0.003 (0.01)	[−0.02, 0.03]	0.02 (0.02)	[−0.01, 0.05]	−0.001 (0.02)	[−0.03, 0.03]
Gender $\alpha$	0.07 (0.07)	[−0.06, 0.21]	0.15 ** (0.08)	[0.01, 0.30]	0.01 (0.08)	[−0.05, 0.24]
Perceived stress	0.50 ** (0.03)	[0.43, 0.56]	0.12 ** (0.04)	[0.04, 0.21]	0.09 * (0.04)	[0.002, 0.17]
Fatigue			0.14 ** (0.04)	[0.06, 0.23]	−0.01 (0.04)	[−0.09, 0.08]
Negative coping styles					0.26 ** (0.04)	[0.18, 0.33]
	$R^2 = 0.26$ $F(3, 712) = 79.63, p < 0.01$		$R^2 = 0.06$ $F(4, 711) = 11.53, p < 0.01$		$R^2 = 0.09$ $F(5, 710) = 12.87, p < 0.01$	

Each variable displayed within the model was normalized prior to its incorporation into the equation. Boot standard error (SE), boot confidence interval (CI) upper limit (ULCI), and boot CI lower limit (LLCI) are indicative of the standard deviation (SD) of the indirect effect evaluated through the deviation correction percentile Bootstrap approach and the upper and lower limits of the respective 95% confidence intervals (CIs); DV = dependent variable, CI = confidence interval. \*  $p < 0.05$ , \*\*  $p < 0.01$ .

**Table 3.** Mediating effect test of fatigue and negative coping style.

	Indirect Effect Value	Boot SE	LLCI	ULCI	Relative Mediating Effect
Total indirect effect	0.05	0.02	0.002	0.09	34.11%
Indirect effect 1	−0.004	0.02	−0.05	0.04	
Indirect effect 2	0.02	0.01	0.01	0.03	13.78%
Indirect effect 3	0.03	0.01	0.01	0.06	23.58%

LLCI: lower limit confidence interval; ULCI: upper limit confidence interval.



**Figure 2.** The mediation model of the association between perceived stress and cyberloafing. Path values are the path coefficients. \*  $p < 0.05$ , \*\*  $p < 0.01$ .

#### 4. Discussion

Based on prior works, this study further examined the effects of fatigue and negative coping styles on mediating the association between perceived stress and cyberloafing among Chinese college students. Perceived stress was found to be a vital factor that predicted cyberloafing, while fatigue and negative coping styles had certain effects on mediating the relationship between perceived stress and cyberloafing.

##### 4.1. Perceived Stress and Cyberloafing

Our results suggest that perceived stress is positively associated with cyberloafing, which supports H1. This result is consistent with prior findings [3,9,57]. Our results also

support the view that perceived stress is a critical antecedent of cyberloafing among college students, wherein technologies, such as mobile phones or computers, are used as a means of reducing the negative feelings and overwhelming emotions that are aroused [19,20]. Therefore, they may engage in cyberloafing behaviors.

#### *4.2. Mediating Role of Fatigue between Perceived Stress and Cyberloafing*

We did not find that fatigue mediated the relationship between perceived stress and cyberloafing behavior of college students. Thus, H2 was not supported. Perceived stress was shown to be positively correlated with fatigue in our study, which is consistent with the findings of the prior research [58]. Findings from a prior study revealed that perceived stress might be negatively associated with a person's self-control abilities, the absence of which might render them more susceptible to depleting their cognitive resources, leading to fatigue [27]. However, fatigue was negligibly related to cyberloafing in our study, which is inconsistent with the findings from prior studies. Previous studies indicated that cyberloafing might function as an efficient method for employees to recover in work settings. For example, Aghaz and Sheikh [25] found that individual work fatigue had a significant positive predictive effect on cyberloafing. A possible explanation for our finding is that college students have greater freedom and choice of activities than do working staff; thus, when fatigued, college students have more options for seeking rest, such as taking a break from classes [59].

#### *4.3. Mediating Role of Negative Coping Styles between Perceived Stress and Cyberloafing*

Negative coping styles, when viewed as a maladaptive cognitive-emotional regulation strategy related to unhealthy behavior, have been suggested as significantly associated with problematic internet use [48]. Our study indicated that negative coping styles are also a mediator in the association between perceived stress and cyberloafing, which supports H3. Prior research studies have found that individuals with high perceived stress usually adopt negative coping styles [60] and engage in problematic internet use, such as cyberloafing. College students with higher levels of perceived stress have more negative emotions, which serves to reduce their flexibility of thinking and narrow their cognitive range, so they are more likely to adopt negative ways to deal with pressure [32]. Moreover, cyberloafing was also seen as compensation for coping with negative emotions [61]. Therefore, in college students where perceived stress positively predicts a greater presence of negative coping styles, the likelihood of cyberloafing behavior is similarly increased.

#### *4.4. Perceived Stress Influencing Cyberloafing through the Mediation of Fatigue and Negative Coping Styles*

Our findings also help to illuminate the roles of fatigue and negative coping styles in sequentially mediating the association between perceived stress and cyberloafing, which supports H4. Fatigue could well affect the coping styles of college students, which, in turn, influences their cyberloafing behavior. In other words, college students who experience an excess amount of stress are more likely to adopt negative coping strategies [62] in response to fatigue and concurrently attempt to avoid stress by engaging in cyberloafing [40,63]. Comprehensive statistical models that involve multiple mediators seem better suited to illuminate the complex relationship between perceived stress and cyberloafing.

### **5. Limitations and Future Research**

Although helpful in understanding antecedents to cyberloafing, as our study employed a cross-sectional design, causal relationships cannot be supported. Follow-on studies that incorporate experimental or longitudinal designs have greater potential to identify any possible cause-and-effect relationships among these variables. Although our participants were enrolled from three separate universities within central China, they may not be fully representative of all college students in China; thus, the extent to which our findings generalize to other populations cannot be determined. Addressing this consideration will require conducting further large-scale studies with broader and more representative

samples. We chose to focus intensively on internal factors, such as fatigue and coping, but we acknowledge that various external or environmental factors may play an important role as well. Simultaneous examination of individual and environmental factors, drawing upon multiple sources of data, may lead to further (unique?) insights into the key determinants of cyberloafing and how to address it and minimize its adverse impact.

Available data indicate that a sizeable percentage of students who enter college have a diagnosable mental health disorder, with few ever seeking treatment [64,65]. A recent study [66] followed the academic trajectory of 201 first year students diagnosed with ADHD (97 receiving medication, 104 not on medication) and compared their performance to 205 entering students without ADHD over a four-year period. Students with ADHD obtained significantly lower grades, reported less frequent use of strategies that have been shown to enhance study skills, and had greater attrition after eight semesters than those without ADHD (an approximate 10% difference). We mention this as just one mental health condition prevalent among college students (problems regulating attention) that conceivably could have impacted our findings. In fact, we found a small-scale study that evaluated a multicomponent cognitive retraining program for improving sustained attention in 20 male college students exhibiting signs of attention deficits and internet addiction, 10 of whom received treatment vs. 10 who served as controls [67]. Those who received treatment showed improved performance on sustained attention, assessed with a digital vigilance test, at the end of treatment, with no change for the untreated controls. Unfortunately, change in time spent on the Internet was not assessed. We mention this to highlight additional aspects that warrant consideration in future investigations, such as ADHD; however, it was not feasible for us to assess concomitant disorders or psychological problems and evaluate their potential impact in our initial exploratory investigation.

An emerging body of research suggests another promising avenue that warrants a greater focus when exploring potential mechanisms underlying cyberloafing. Upon completing an in-depth examination of studies investigating the association between neural mechanisms, genetics, and internet and videogame addiction, Weinstein and Lejoyeux [68] concluded that long-term internet video game playing was associated with certain structural changes in brain regions responsible for regulating reward and impulse control (as well as sensory-motor coordination). More specifically, internet gaming led to increased release of dopamine, similar to that occurring for drugs of abuse. A creative study of the reinforcement value of smartphones [69] found it to be a more powerful reinforcer than food, even when participants underwent a period of “modest” deprivation of food, with the strength of this relationship intensifying as a function of use. Further basic studies of the inherent reinforcing value of using smartphones and engaging in certain activities on the Internet merit strong consideration as well.

## 6. Conclusions

The present study was designed to explore a new perspective by identifying other important mediators between perceived stress and cyberloafing among college students. We found that fatigue and negative coping styles mediate the relationship between these two variables. Of these, negative coping styles served a partial mediator role, but fatigue did not mediate the association between perceived stress and cyberloafing.

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**Institutional Review Board Statement:** The study was conducted according to the following guidelines: Statement Approved by the Three Gorges University Scientific Research Ethics Committee.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data are not publicly available due to legal reasons.

**Conflicts of Interest:** The authors declare no conflict of interest.

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