Moderated-Mediation Roles: Relationship between Internet Addiction, Neuroticism, Perceived Stress, and Adaptive Coping Style among Indonesian Migrant Workers in Taiwan

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Peran Moderasi dan Mediasi dalam Hubungan Adiksi Internet, Neurotisisme, *Perceived Stress* dan *Adaptive Coping Style* pada Pekerja Migran Indonesia di Taiwan

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ABSTRACT

This study examined the relationship of neuroticism and internet addiction by investigating the mediating role of perceived stress and the moderating role of adaptive coping style among Indonesian migrant workers in Taiwan. The study was conducted with a cross-sectional design on 466 migrant Indonesian workers collected in Indonesian working places and the leisure activity places in Taipei and Taichung area in Taiwan by purposive sampling. Participants completed a survey, including measures of neuroticism, internet addiction, perceived stress, and adaptive coping style. The results showed that perceived stress mediated the association of neuroticism with internet addiction. Furthermore, adaptive coping style moderated the strength of the mediation between neuroticism and internet addiction via perceived stress, such that the mediated relationship weakened under the higher levels of adaptive coping style than under the lower levels of adaptive coping style. These results supported the hypothesized model. However, the model needs further examination in a large-scale longitudinal study.

Original Article

ABSTRAK

Penelitian ini menguji hubungan neurotisisme dan adiksi internet dengan menguji peran mediasi *perceived stress* dan peran moderasi dari *adaptive coping style* pada pekerja migran Indonesia di Taiwan. Penelitian cross-sectional dengan *purposive sampling* dilakukan pada 466 partisipan pekerja migran Indonesia di Taiwan wilayah Taipei dan Taichung. Partisipan berpartisipasi dengan sukarela mengisi kuesioner untuk mengukur neurotisisme, adiksi internet*, perceived stress,* dan *adaptive coping style*. Hasil penelitian menunjukkan bahwa *perceived stress* berperan sebagai mediator hubungan antara neurotisisme dan adiksi internet. Selanjutnya *adaptive coping style* memoderasi kekuatan hubungan mediasi, dimana kekuatan mediasi *perceived stress* dalam hubungan antara neurotisisme dan adiksi internet melemah jika level *adaptive coping style* meningkat dan sebaliknya. Hasil penelitian mendukung model yang dihipotesakan. Tetapi, model penelitian perlu diuji kembali di studi longitudinal yang besar.

1. Introduction

Internet addiction has affected people in every stage of lifespan and population of adolescent and young adults (Ah & Jeong, 2011; Deatherage et al., 2014; Zamani et al., 2011; Zhou et al., 2017). The term 'internet addiction' was firstly introduced by Dr. Kimberly S. Young (Young, 1998). Although many believed the term of *addiction* should be applied only to cases involving the chemical substances or drug (Walker, 1989), similar diagnostic criteria have been applied to many problem behaviors such as pathological gambling (M. Griffiths, 2000; M. D. Griffiths, 1990). Also, M.

Griffiths (2000) considered internet addiction to be a kind of technological addiction, and one in a subset of behavioral addictions with core components of addiction are salience, mood modification, tolerance, withdrawal, conflict, and relapse.

This study focuses on targeting a specific working population which is Indonesian migrant workers in Taiwan. Migrant workers in Taiwan are those who moved temporarily to Taiwan for work, mostly from South-East Asian countries including Indonesia, Vietnam, Philippines, and Thailand (H.-I. Cheng, 2016). Based on data from Workforce Development Agency

(MOL, 2017), the total Indonesian workers in Taiwan are 256,592 people (61,703 males; 194,889 females) consisting of 8,106 people (3.15%) in agriculture, forestry, fishing & animal husbandry (crewman), 58,509 people (22.8%) in manufacturing, 1,192 people (0.46%) in construction and 188,785 (73%) in social welfare including caregivers and home maids.

Regarding being migrant workers, they experience difficulties due to adaptation to a new culture which causes people anxiety and stress. They faced communication and language problems, long working hours, loneliness, and homesickness (H.-M. Huang & Soong, 2013; Nilvarangkul et al., 2010). Studies revealed that living and working in a new culture caused people stress. They experienced depressive symptoms such as frustration and hopelessness (Bhattacharya, 2008; Michael et al., 2008). An exploratory study among female domestic workers from the Philippines in Taiwan explored their stress during the migration, which showed that they experience loneliness, homesickness, and difficulties in adjusting to a different culture (van der Ham et al., 2015). Some migrant workers are disadvantaged because of the lower economic status group and experience discrimination (Major et al., 2013). Indonesian female workers who mostly work as caregivers to the elderly face difficulties such as communication issues, long working hours, sickness, living together with the elderly patient and sometimes double as maid (H.-M. Huang & Soong, 2013; Loveband, 2004). Facing those difficulties, several studies reported some coping strategies that are often used by migrants including seeking social support and cultural integration (A. T.-A. Cheng & Chang, 1999; Ritsner et al., 1997), religious beliefs, cognitive strategies such as reframing the situation, relying on their inner resources and focusing on future wishes and aspirations (Khawaja et al., 2008). During the process of being migrant workers, female workers usually have different coping styles. In the beginning or before migration, problem-focused coping is mainly used such as finding financial resources and then, emotion-focused coping styles become more dominant to endure the situation, such as seeking social support and doing religious activities, for instance, praying (van der Ham et al., 2015). Also, the use of the information communication technology (ICT) for migrant workers is very crucial (Chib et al., 2013; Smales, 2010). These workers use mobile phones to seek emotional comfort from families and to vent their emotions. The availability and the accessibility to the internet through mobile phones (Ching et al., 2017) have become significant devices for migrant workers to adapt to new environments (Roldan, 2009).

Traditionally, migrant workers use the internet as media to link and communicate with their significant people such as families and friends. Mobile phones and the internet are the most crucial communication devices that enable them to maintain emotional links with friends and families and to develop their social networks (Thomas & Lim, 2009). A study among migrant workers in the Pearl River Delta, Main-Land China revealed that the internet has positive influences on migrant workers' jobs and social lives. The internet provides information related to the job, entertainment, and relaxation. The online chat and the virtual community provide migrant workers with emotional support and a strong sense of their local identity, the internet café and online games allow them to release the pressures of work (Peng, 2008).

However, a study among employees suggested that employees who turn to technology (i.e. internet) to manage their high job demands, have inadequate resources to offset demands, or poor work-life balance become excessive users (Buckner et al., 2012). Moreover, information technology workers use the internet such as online chatting to avoid other work commitments and then become immersed in these activities spending more time than intended online (Thatcher et al., 2008). Previous research also found that psychological pressure affects the frequency of phone usage and the greater the pressure that workers feel, the more the workers will become internet-addicted (Huang, 2016).

Among the many factors that contribute to internet addiction, several studies have shown evidence that neuroticism personality positively predicts internet addiction (Kayiş et al., 2016; Kuss et al., 2013; van der Ham et al., 2015; Zamani et al., 2011; Zhou et al., 2017). Along with this, previous study also has shown that perceived stress is a significant predictor of internet addiction (Ah & Jeong, 2011). The internet is used as a way to release stress (Jun & Choi, 2015; Velezmoro et al., 2010) and to regulate negative feelings from loneliness (Caplan, 2006).

Even though neuroticism may lead to distress and stressors can cause negative feelings and when accumulated it becomes difficult to cope, coping strategies can be used to face them. Adaptive coping strategies (e.g. active coping, instrumental support, planning, acceptance, emotional support, humor, positive reframing, and religion) may lead to positive outcomes, whereas maladaptive coping styles (e.g. self-distraction, behavioral disengagement, denial, self-blame, substance abuse, and venting) may lead to negative outcomes (Carver, 1997; Kasi et al., 2012; Moore et al., 2011).

Many previous studies have focused on exploring the relationship between maladaptive coping style and internet addiction (W. P. Chou et al., 2015; Deatherage et al., 2014; D. Li et al., 2016; H. Li et al., 2016) but

only a few studies investigate adaptive coping style (D. Li et al., 2016). Therefore, the present study aimed to examine the role of perceived stress and adaptive coping style in the relationship between neuroticism and internet addiction. Furthermore, the present study would reveal the prevalence and the degree of internet addiction among Indonesian workers in Taiwan.

Neuroticism and Internet Addiction
Neuroticism is one of the personality characteristics which was found to be a significant risk factor for internet addiction (Kayiş et al., 2016; Rafiq, 2016; Wang et al., 2015; Zhou et al., 2017). Neuroticism is defined as the tendency to feel guilty, depressed, or anxious. The characteristic of this personality trait involves anxiety, hopelessness, depression, pessimism, feeling vulnerable, being angry, embarrassed, emotional, worried and insecure (Barrick & Mount, 1991; McCrae & Costa Jr, 1999).

In a study of internet use and motives, neurotic persons turn to the internet when they are lonely and they may feel as if they are a part of a group, they feel comfortable with online interaction because they can express their true selves or 'real me' online (Amichai-Hamburger et al., 2002; Amiel & Sargent, 2004). Research also reported that having online communication can help them to escape the distress caused by face-to-face interaction, which means that online communication is an escape from a stressful situation (McElroy et al., 2007). Avoiding stress also leads them to spend more time playing the game (Peters & Malesky Jr, 2008).

Accordingly, we propose that neuroticism plays an important role as a risk factor for internet addiction. Individuals with neuroticism experience distress situations and troubled relationships, which make them tend to involve themselves on the internet to avoid stressful experiences. We hypothesized the following:
Hypothesis 1: Neuroticism would be positively associated with internet addiction among Indonesian migrant workers in Taiwan.

Neuroticism and Perceived Stress
Previous research findings have found that neuroticism makes people prone to experience negative emotions and distress (Pugsley, 2002; Vollrath & Torgersen, 2000). Individuals with high neuroticism would experience more stressful events (Bolger & Schilling, 1991; Fergusson & Horwood, 1987; Watson, 1984). People who have high neuroticism have reported greater distress when faced with work overload and interpersonal stress, than those who have low neuroticism. Also, women with high neuroticism and socially disadvantaged backgrounds reported higher life-event exposure than women with low neuroticism (Fergusson & Horwood, 1987).

Bolger and Schilling (1991) explained how neurotic personality traits lead to distress in several ways. Firstly, as primary importance in determining stress vulnerability, neuroticism makes people get into a stressful situation more than others. Hence, the high-neurotic person was found more distressed than low neuroticism (Vollrath & Torgersen, 2000). Second, people with high neuroticism have higher reactivity to stress. A high-neurotic person is more exposed to the stressor than a low-neurotic person, and are more likely to report a stressful event. According to the abovementioned studies, neuroticism is revealed as an important factor for stress experiences and stress reactivity (Schneider, 2004). Based on the review above, we hypothesized the following:
Hypothesis 2: Neuroticism would be positively related to perceived stress among Indonesian workers in Taiwan.

Perceived Stress and Internet Addiction
Perceive stress is a condition that event or stressor influence when those persons appraise them as stressful, which means that stress appraisals are determined not only by the stimulus condition but more importantly by the person's interpretation of their relationship to their environment (Cohen et al., 1995). Referring to the concept explained by Sheldon Cohen et al. (1995), we conceptualized perceived stress as an individual's interpretation or perception of stimulus-response (stressor) and their relationship with the environment.

Stress is considered as an important factor related to maladjustments such as psychological distress, mental health problems, and emotional disorders (Dougall & Baum, 2001; Moeini et al., 2008). Stress significantly correlates with depression (Unger et al., 2001), psychological or physical risk (Baldwin et al., 1997; Dohrenwend, 1998). Moreover, life stress is a risk factor for substance addiction and addiction relapse (Sinha, 2008).

Previous research among adolescents found that stress is a significant antecedent of internet addiction (Ah & Jeong, 2011). This result is consistent with the general strain theory that a variety of stress including life stress can cause negative emotion which later on causes problem behavior or addiction to something to release from negative emotion (Agnew, 1992). Related to theory, some researchers have found that the internet is used by some people to relieve stress (Lavoie & Pychyl, 2001; Velezmoro et al., 2010).

Some empirical findings also have documented the association between stress and internet addiction widely among adolescents and young adults particularly in the relationship between academic stress and internet addiction. A study found that academic stress positively

influences internet addiction through negative emotions (Jun & Choi, 2015). Also, life stress including family and emotional stress had positive predictive power for smartphone addiction (Chiu, 2014). Mirroring to the previous result we hypothesized the following:

Hypothesis 3: Perceived stress would be positively related to internet addiction among Indonesian workers in Taiwan.

The Mediating Role of Perceived Stress in the Relationship between Neuroticism and Internet Addiction

As we have mentioned above, there is a positive relationship between neuroticism and internet addiction (Hypothesis 1) and a positive relationship between perceived stress and internet addiction (Hypothesis 2), together these hypotheses state a model in which neuroticism indirectly increases internet addiction through perceived stress. In other words, perceived stress mediates the relationship between neuroticism and internet addiction.

The mediating role of perceived stress is supported by some studies that high-neuroticism person was found more distressed, reported greater distress, and had higher reactivity to stress than the low-neuroticism person (Bolger & Schilling, 1991; Fergusson & Horwood, 1987; Schneider, 2004; Vollrath & Torgerson, 2000; Watson, 1984), which then may lead to internet addiction. Besides, perceived stress was found as a significant mediator of the relationship between neurotic trait and depressive and anxious symptoms (Pereira-Morales et al., 2017) and perceived stress also mediates the association between the deficit in recognizing facial expression with internet addiction (Z. Chen et al., 2017). Accordingly, we hypothesized that perceived stress mediates the relationship between neuroticism and internet addiction.

Hypothesis 4: Perceived stress would mediate the relationship between neuroticism and internet addiction.

The Moderating Role of Adaptive Coping Style linking Neuroticism to Internet Addiction through Perceived Stress

Even though neuroticism may lead to distress and stressors can cause a negative feeling that makes it more difficult for individuals to cope with them, individuals may have coping strategies or ways to face several difficulties. Coping style is operationalized as the way or effort in how people react to the stressor including cognitive and behavioral efforts (Carver et al., 1989; Folkman, 1984). Adaptive coping style is defined as those coping styles which lead to positive outcomes, such as active coping, instrumental support, planning, acceptance, emotional support, humor, positive reframing, and religion. Several studies have shown adaptive coping strategies such as seeking social support, cultural integration and religious practices are

often used by migrants (A. T.-A. Cheng & Chang, 1999; Khawaja et al., 2008). Empirical study has shown that problem-solving coping strategies were found negatively associated with internet addiction (Al-Gamal et al., 2016). In contrast, Carver et al. (1989) suggested neuroticism is positively related to behavioral disengagement, mental disengagement, denial, and venting of emotion, therefore they tend to use the maladaptive coping style such as escape-avoidance and self-blame strategies (Hooker et al., 1994; McCrae & Costa, 1986).

Migrants have been observed to gain social support with increased access to communication networks through information and communication technologies (ICTs) with internet media. Mobile phones using both text messages and voice calls allow migrants to build and maintain social support networks within the host country while maintaining ties to the home country (Chib et al., 2013).

In the concern to the prevention of internet addiction, the present study aimed to examine coping strategies, especially the role of the adaptive coping style in linking neuroticism to internet addiction through perceived stress. We propose that both (a) the relationship between neuroticism and perceived stress and (b) the relationship between perceived stress and internet addiction will be moderated by adaptive coping style, such that the strength of these relationships will be lower when migrant workers possess high (rather than low) levels of adaptive coping style.
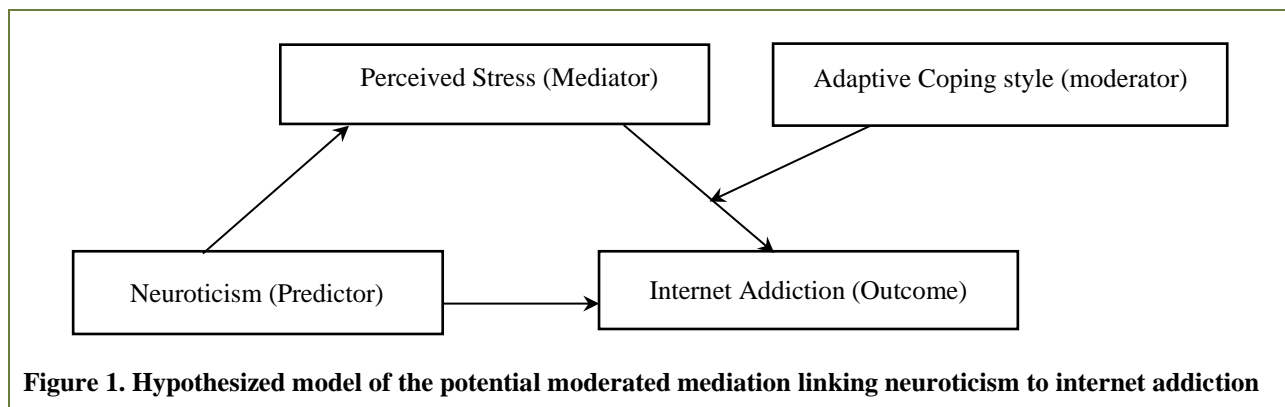
Hypothesis 5: Adaptive coping style moderate the indirect effects of neuroticism on internet addiction through perceived stress; ie the mediated effects would be lower when the migrant workers are high in adaptive coping style

Based on the literature review and hypotheses proposed above, the present study would examine the following model: neuroticism is related with internet addiction and mediated by perceived stress, in which adaptive coping style moderated the relationship between perceived stress and internet addiction in Indonesian migrant workers in Taiwan (as shown in Figure 1).

2. Methods

Participants and Procedures

This study was approved by the Research Ethics Committee of the corresponding author's institution. Participants were Indonesian migrant workers in Taiwan. A total of 449 Indonesian workers were selected from Indonesian working places and the leisure activity places in Taipei and Taichung area by purposive sampling. Participant inclusion criterion is laborer called *Buruh Migran* Indonesia (BMI) or *Tenaga Kerja*

Figure 1. Hypothesized model of the potential moderated mediation linking neuroticism to internet addiction

Indonesia (TKI), and exclusion criterion is professional workers. The data were collected by instruments in the Indonesian language (Bahasa Indonesia). The English version of the Internet Addiction Test (IAT), Perceived Stress Scale (PSS), and the Brief COPE for adaptive coping subscale were translated into Bahasa Indonesia by the back-translation method which is judged and validated using a rating scale. Whereas for the neuroticism scale, the researcher used the instrument which had been adapted to Bahasa Indonesia. We used an online and paper and pencil version of the questionnaires, but all content is identical. Participants were informed of the purpose of the study and were invited to complete the questionnaire anonymously, they can choose either the online or paper and pencil version after informed consent was obtained by asking their agreement to participate voluntarily in the study.

Measures
Demographic data. Demographic data were collected using items developed by the researcher including age, gender, marital status, education, the origin of residence in Indonesia, city of residence in Taiwan, how long they have been living in Taiwan, job, media used for going online, online activities, the average time spent for online in weekdays, and the average times spent for online in weekend and holidays.

Neuroticism. Neuroticism was measured using the neuroticism subscale of the Indonesian Big Five Inventory (BFI). The neuroticism scale consists of 8 items. Participants answered the items using a 5-point scale (1= Disagree strongly; 2= Disagree a little; 3= neither agree nor disagree; 4= Agree a little; 5= Agree Strongly). Internal consistency of the Indonesian version of neuroticism subscale is $\alpha = 0.74$ (Ramdhani, 2012). The Cronbach's α of the neuroticism subscale in the current study was 0.60.

Internet Addiction. Internet addiction was measured by the Indonesian version of the Internet Addiction Test (IAT) which was introduced by Young (1998). This instrument consists of 20-items that investigate six

factors: salience, excess use, neglecting work, anticipation, lack of self-control, and neglecting social life. Responses were answered on a 5-point Likert scale from 1 (never) to 5 (always), with 20 the minimum and 100 the maximum score. Young suggests that a score of 0 to 30 points reflects a normal level of internet usage, 31 to 49 indicate the presence of a mild level of internet addiction; 50 to 79 indicate moderate level, and 80 to 100 indicate a severe level of addiction. Cronbach's alpha of the scale is 0.80 in the Indonesian version (Dewi, 2011). In the current study, Cronbach's α was 0.86.

Perceived Stress. The migrant workers' stress was examined with the Indonesian version of the Perceived Stress Scale (PSS, Cohen et al., 1983), which is generally used to measure the individual's perception about the situation during the previous month which is appraised as a stressful condition. The abbreviated PSS-10 (10 items) was used in this study. Participants answered items using a 5-point scale (0= never; 1= almost never; 2= sometimes; 3= fairly often; 4= very often). The 10-item Indonesion version of the PSS had a reliability of Cronbach's $\alpha = 0.96$ (Maulana et al., 2014). In the current study, reliability was $\alpha = 0.72$.

Adaptive Coping Style. The adaptive coping style of the Indonesian workers in Taiwan was measured by the Indonesian version of the Brief COPE inventory. The original COPE Inventory (Carver et al., 1989) has 60 items and 15 scales. The Brief COPE inventory (Carver, 1997) is a 28-item instrument with 14 subscales. The Brief COPE is a self-report questionnaire used to measure the coping behaviors and thoughts a person may have in response to a specific situation (Carver, 1997). Generally, the Brief COPE grouped them into 2 categories of coping style tendencies: adaptive coping style and maladaptive coping style. The adaptive coping style includes active coping, instrumental support, planning, acceptance, emotional support, humor, positive reframing, and religion. Whereas maladaptive coping style includes self-distraction, behavioral disengagement, denial, self-blame, substance abuse, and

venting (Carver, 1997; Kasi et al., 2012; Moore et al., 2011). In this present study, we only measured the adaptive coping style and participants answered items using a 4-point scale (1 = I haven't been doing this at all to 4 = I've been doing this a lot). Internal reliabilities for the 14 subscales range from Cronbach's α = 0.57 - 0.90 (Carver, 1997). In the current study, Cronbach's α of the adaptive coping style inventory was 0.87.

Data Analyses. The Statistical Package for the Social Sciences (SPSS) version 22 and PROCESS were used for data analyses. The level of statistical significance was set at $p \leq 0.05$ for all tests. We used the Pearson Correlation to determine the relationships among variables and then we tested our study hypotheses in two interlinked steps. First, we examined the simple mediation model (Hypothesis 1-4). Second, we tested the moderated mediation hypothesis by incorporating the proposed moderator variable which is the adaptive coping into the model (Hypothesis 5).

Test of mediation. The product of coefficient strategy with the bootstrap method was used to test the strength and the significance of the indirect effect. The indirect effect was estimated by first regressing perceived stress (mediator) on neuroticism (predictor), and subsequently regressing internet addiction (outcome) on perceived stress and neuroticism. The indirect effect was quantified based on the mean bootstrapped sample estimates of the regression coefficients ("perceived stress on neuroticism" X "internet addiction on perceived stress controlling for neuroticism"). This study implemented the standard deviation of the

estimate of the indirect effect obtained over 5000 bootstrapped resamples (Preacher et al., 2007).

Test of moderated mediation. To test the strength of the indirect (mediation) effect which conditionally depends on the level values of the adaptive coping style (*conditional indirect effects*), we also implemented analyses using bootstrapping. Firstly, perceived stress (mediator) was regressed on neuroticism (predictor). Subsequently, internet addiction (outcome) was regressed on perceived stress, adaptive coping style, and the interaction between perceived stress and adaptive coping style (mediator X moderator). Regression analyses were then conducted on several values of the moderator (M, $\pm$ 1 SD) to obtain the degree to which mediation varies depending on the level of the moderator.

3. Results

Descriptive Statistics
Participants ranged in age from 19-47 years (M = 28.35; SD = 5.34). Males accounted for 51.7% (n = 232) of the participants, while females accounted for 48.3% (n = 217). The majority of participants were single (46.8%) and originally came from Java Island in Indonesia (76.8%). Regarding the educational background, most of the participants graduated from senior high school (62.4%). Participants reported that they have been living in Taiwan for an average of 2.88 years (SD = 2.11). An overview of the demographic characteristics of the total sample is provided in Table 1.

Table 1. Participant's characteristics

Characteristic	Mean (*SD*)	Frequency (*N* = 449)	Percentage
Age	28.35 years (5.34)		
Gender			
Male		232	51.7
Female		217	48.3
Marital Status			
Single		210	46.8
Married		174	38.8
Other (widow/divorced/separated)		65	14.5
Education			
Elementary School		22	4.9
Junior High School		133	29.6
Senior High School		280	62.4
College		14	3.1
Long-lived in Taiwan (years)	2.88 years (2.11)		
Origin residence in Indonesia			
Java		345	76.8
Sumatera		92	20.4
others		12	2.6

Table 2. Prevalence of internet addiction among Indonesian workers

Internet addiction level	Male		Female		Total (*N* =449)	
	n	Percentage	*n*	Percentage	*n*	Percentage
No addiction	56	12.5	61	13.6	117	26.1
Mild	145	32.3	130	28.9	275	61.2
Moderate	31	6.9	26	5.8	57	12.7

Table 3. Descriptive statistic and study variable inter-correlations

Variable		*M*	*SD*	1	2	3	4
1.	Internet addiction	37.82	10.32	-			
2.	Perceived stress	11.83	4.77	0.399**	-		
3.	Neuroticism	21.18	4.30	0.359**	0.424**	-	
4.	Adaptive Coping style	44.38	9.45	0.047	0.124**	-0.077	-

Note. **$p < 0.01$

Table 4. Regression result for simple mediation

Variable	*B*	*SE*	*T*	*p*
Direct and total effect				
Internet addiction regressed on neuroticism	0.862	0.106	8.136	0.000
Perceived stress regressed on neuroticism	0.471	0.047	9.912	0.000
Internet addiction regressed on perceived stress, controlling for neuroticism	0.650	0.101	6.436	0.000
Internet addiction regress on neuroticism, controlling for perceived stress	0.556	0.112	4.961	0.000
	Value	*SE*	*LL* 95% CI	*UL* 95% CI
Bootstrap result for the indirect effect				
Effect	0.306	0.60	0.199	0.434

Note. CI = *confidence interval*; *LL = lower limit; UL = upper limit.*

Internet Addiction Prevalence

Based on the scores from the Internet Addiction Test (IAT), we computed the prevalence of internet addiction among Indonesian migrant workers. From these 449 Indonesian workers we found that 57 (12.7%) participants were in a moderate level of internet addiction, 275 (61.2%) participants were in a mild level of internet addiction, and 117 (26.1%) participants with no internet addiction. Prevalence rates for Indonesian workers with internet addiction are presented in detail in Table 2.

Correlation among Variables

Table 3 presents means, standard deviations, and inter-correlations for all variables. Neuroticism was positively related to internet addiction (*r* = 0.359, *p* <0.05) and perceived stress (*r* = 0.424, *p* < 0.01). Positive relationship was found between perceived stress and internet addiction (*r* = 0.399, *p* < 0.01) whereas adaptive coping style was not significantly correlated with internet addiction (*r* = 0.047, *p* >0.05) and neuroticism (*r* = 0.077, *p* > 0.05) but positively associated with perceived stress (*r* = 0.124, *p* < 0.01).

Test of Mediation

Table 4 presents the result for hypotheses 1-4. Regarding hypothesis 1, the result showed that

neuroticism was positively associated with internet addiction as indicated by a significant regression coefficient (*B*= 0.862, *t* (447) = 8.136, *p* <0.01). Regarding hypothesis 2, it was found that neuroticism was positively related to perceived stress (*B*= 0.471, *t* (447) = 9.912, *p* <0.01). Supporting hypothesis 3, results indicated that the mediator, perceived stress, was positively associated with internet addiction (*B*= 0.65, *t* (446) = 6.436, *p* <0.01).

As we found both path *a* and path *b* were significant, therefore we tested the mediation analyses using the bootstrap method (MacKinnon et al., 2004; Preacher & Hayes, 2004). In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstraps resamples (Preacher & Hayes, 2008). Our results confirmed the mediating role of perceived stress in the relation between neuroticism and internet addiction (*B*= 0.556, *t* (447) =4.961, *p* <0.01) as we hypothesized (hypothesis 4). Also, results indicated that perceived stress only partially mediated the relation between neuroticism and internet addiction, as neuroticism still had a significant direct effect on internet addiction.

Table 5. Regression result for conditional indirect effect

Predictor	*B*	*SE*	*t*	*p*
	Perceived Stress			
constant	-9.972	1.027	-9.714	0.000
Neuroticism	0.471	0.47	9.912	0.000
	R^2(0.180), *F* (447) = 98.251			
	Internet addiction			
constant	25.516	2.431	10.498	0.000
Perceived stress (PS)	0.637	0.102	6.239	0.000
Adaptive coping	0.019	0.47	0.403	0.687
Perceived Stress x Adaptive coping	-0.023	0.10	-2.335	0.020
	R^2(0.213), *F* (444) = 30.122			
Adaptive coping	**Indirect effect**	*SE*	*LLCI*	*ULCI*
Conditional indirect effect at Adaptive coping = *M* ± 1 *SD*				
-1 *SD* (-3.047)	0.402	0.079	0.262	0.574
M (0.00)	0.300	0.059	0.194	0.429
+1 *SD* (3.047)	0.198	0.067	0.078	0.344

Note. CI = confidence interval; LL = lower limit; UL = upper limit; Reported indirect effect, SE, and its lower and upper limit confidence interval coefficients are bootstrapped.
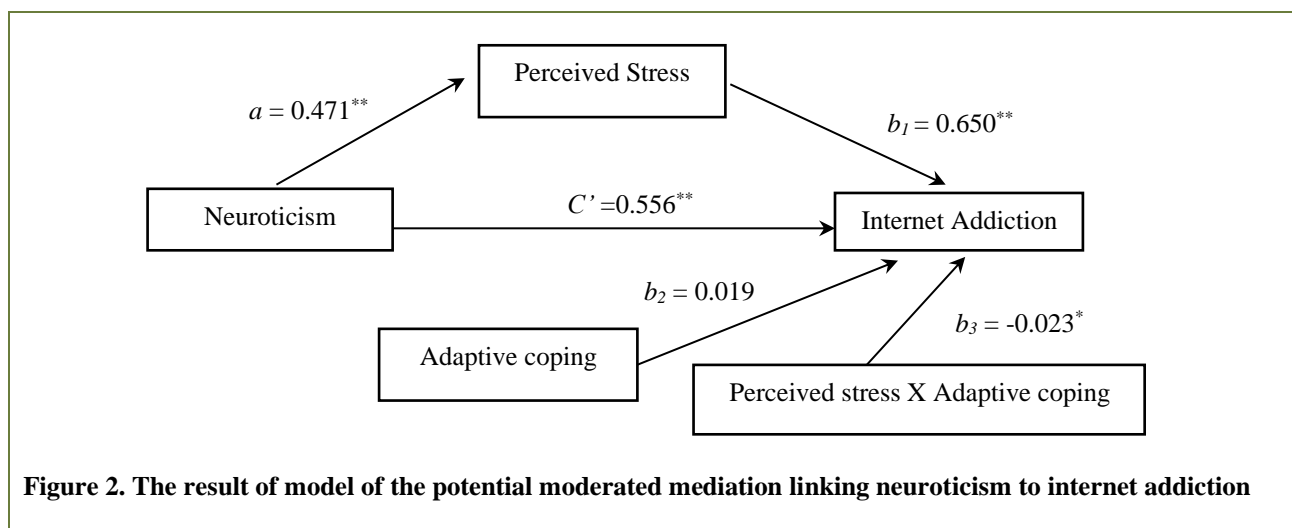

Figure 2. The result of model of the potential moderated mediation linking neuroticism to internet addiction

Test of Moderated Mediation

Regarding hypothesis 5 (Table 5), we predicted that adaptive coping style moderates the indirect effects of neuroticism on internet addiction through perceived stress.

The result indicated that the cross-product term between perceived stress and adaptive coping style was significant (B = -0.023, t = -2.335 p < 0.05). The significant interaction effect supported the assumption of moderated mediation (Figure 2).

Therefore, we examined the conditional indirect effect of neuroticism on internet addiction (through perceived stress) at three values of adaptive coping including the low level of adaptive coping style (-1*SD*), mean level (*M*), and high level of adaptive coping style (+1 *SD*) as shown in Table 3. Bootstrapping analyses indicated a significant indirect effect of neuroticism on internet addiction in all three values of adaptive coping, which decreased along with the levels of the moderator. Indonesian workers with a low level of adaptive coping had a higher indirect effect of neuroticism on internet addiction through perceived stress (B = 0.402 at -1 *SD*). Indonesian workers with a mean level of adaptive coping had a medium indirect effect (B =0.300 at *M*), whereas Indonesian workers with a high level of adaptive coping had a lower indirect effect of neuroticism to internet addiction through perceived stress (B = 0.198 at +1 *SD*).

Overall these findings revealed that adaptive coping style moderated the strength of the mediated relationship of neuroticism and internet addiction via perceived stress, such that the mediated relationship weakened under the higher levels of adaptive coping style than under the lower levels of adaptive coping style.

4. Discussion

This study examined the moderating role of adaptive coping style and the mediation role of perceived stress linking neuroticism to internet addiction in the context of Indonesian workers in Taiwan.

Demographic Statistic
This study analyzed 446 Indonesian migrant workers as participants. The data was collected with a survey that was provided online and paper-and-pencil. 51.7 % of the participants were male and the rest were female accounted for 48.3 %. We met more male participants than females in the leisure activity places because males work in manufacturing and factories and they have holidays every weekend, whereas females work as caregivers and they only have a holiday once a month. The majority of participants were single (46.8%) and graduated from senior high school (62.4%). The economic problems, difficulties to find a job, poverty and high unemployment are the reasons for them to work as migrant workers, as well as their perception of having relatively high salaries in Taiwan. The participants originally came mostly from Java Island (76.8%) and they have been living in Taiwan for an average of 2.88 years. Commonly, work contracts are set for 3 years. The average time spent online was in the range of 1-2 hours per day on weekdays (35.2%) after they finished working or before they go to sleep, and participants spent more time online on weekends in the range of 4-6 hours per day (33.4%). Mostly they used mobile phones for going online for varied activities, for instance, watching YouTube, gaming online, using social media Facebook, chatting, and video calling. These demographic variables may influence the development of an addiction to the internet. We suggest further research could be conducted to investigate this association to give a better understanding of the factors that contribute to internet addiction.

Internet Addiction Prevalence
Regarding the prevalence of internet addiction, the present study found that the overall prevalence of internet addiction to be 73.9% (mild level = 61.2%; moderate level = 12.7%) and 26.1 % without addiction to the internet. This means that seven out of ten Indonesian workers were at risk of internet addiction.

Surprisingly, even though the prevalence is high in the mild and moderate level addiction, no Indonesian worker was at risk for severe levels of internet addiction. The reason for this is because the working conditions would not allow them to use their communication devices because they work with machines in the factory. Many women caregivers also have restrictions with their personal communication devices. They might go online in the time after work or holiday.

Since the specific prevalence of internet addiction in Indonesia is uncertain, this present study was the first study that revealed the prevalence of internet addiction among Indonesian workers. The previous study measured the internet screen time of the adolescent in Indonesia was found to be quite high (34%) and prone to a higher risk of internet addiction (Kurniasanti et al., 2019). Whereas the worldwide prevalence of internet addiction reached approximately 6% (Cheng & Li, 2014) and the prevalence in Southeast Asia has found a pooled prevalence rate of 20% for internet addiction and 10.1% for gaming disorders, respectively (Chia et al., 2020).

Correlation among Variables
Regarding examination of the correlations, our findings showed that neuroticism was positively related to internet addiction ($r = 0.359$, $p < 0.01$), which is consistent with previous studies (Amichai-Hamburger et al., 2002; Tsai et al., 2009). Similarly, in studies conducted with a student population in Indonesia they found consistent result that neuroticism is significantly correlated with internet and social media addiction (Budysan & Sidjaja, 2019; Sumaryanti et al., 2020), and indirectly related to online game addiction in the adult population (Wiguna et al., 2020). As neuroticism makes people prone to experience negative emotions and distress (Pugsley, 2002; Vollrath & Torgersen, 2000), our findings confirm this previous study that neuroticism also was positively related to perceived stress ($r = 0.424$, $p < 0.01$). People with high neuroticism have reported greater distress when faced with work overload and interpersonal stress than those with low neuroticism. Positive relationship also was found between perceived stress and internet addiction ($r = 0.399$, $p < 0.01$). The general strain theory explains this finding. The variety of stress causes negative emotion which later on causes addiction to something or deviant behavior to escape from stress (Agnew, 1992). The more they feel stress and pressure, the more they get into internet addiction (F. Huang, 2016). A study of stress perception and stress response against Internet Psychological Addiction (IPA) in Indonesia based on psychoneuroimmunology approach emphasized that adolescent who under internet psychological addiction has a high-stress response and perception. The use of the internet excessively causes a change of sensitivity in the nervous system and stimulates Hypothalamus-Pituitary-Adrenalin (HPA-axis), hence, it caused the

cortisol level to increase and perceived stress even more (Fajriah et al., 2020).

Even though adaptive coping style helps lead to positive outcomes and is a protective factor from problem behavior, we found that adaptive coping style was not significantly correlated with internet addiction ($r = 0.047$, $p > 0.05$) and neuroticism ($r = 0.077$, $p < 0.05$). However, adaptive coping style is positively associated with perceived stress ($r = 0.124$, $p < 0.01$).

Hypotheses Analysis

This study analyzed 5 hypotheses, Hypotheses 1-4 were testing the mediation model and Hypothesis 5 was testing a moderated mediation model.

On the testing of the mediation model, firstly we found a strong positive association between neuroticism and internet addiction $B = 0.862$, $p < 0.01$ (Hypothesis 1). It means that neuroticism is a good predictor of internet addiction since neuroticism could lead to distress and people tend to go to the internet as a way of escaping from a stressful situation. This result is consistent with previous studies (Kuss et al., 2013; Zamani et al., 2011; Zhou et al., 2017). Furthermore, a similar study in Indonesia reported that neuroticism has a positive effect on social media addiction because of the collective culture of Indonesia. People with a high level of neuroticism tend to become insecure, self-aware and engage in social comparison through social media and therefore become more addicted to the internet and social media (Alhad, 2015)**.**

We also found that neuroticism significantly predicts perceived stress ($B = 0.471$, $p < 0.01$) in Hypothesis 2. Because people with neuroticism tend to feel guilty, depressed, or anxious (McCrae & Costa Jr, 1999), neuroticism makes people prone to experience emotions and distress. So people with neuroticism would experience more stressful events and report greater distress when faced with work overload and interpersonal stress (Bolger & Schilling, 1991; Fergusson & Horwood, 1987; Watson, 1984).

Regarding Hypothesis 3, our result showed that perceived stress was positively associated with internet addiction ($\beta = 0.65$, $t(446) = 6.436$, $p < 0.01$). It means that the more Indonesian workers experience stressful conditions such as job stress or stress-related to migration, the more they would get into the internet to relieve their stress or at least to communicate with their significant people and friends.

Indonesian workers' perceived stress operates as a significant mediator between neuroticism and internet addiction ($\beta = 0.556$, $t(447) = 4.961$, $p < 0.01$) supporting our Hypothesis 4. Previous research has revealed that perceived stress is one of the significant

predictors of internet addiction (Ah & Jeong, 2011). The internet has become a way to relieve their stress and to manage their negative moods (Jun & Choi, 2015; Velezmoro et al., 2010). Also, perceived stress was found to be a significant mediator of the relationship between neurotic traits and depressive and anxious symptoms (Pereira-Morales et al., 2017) but no previous research has shown the mediation role of perceived stress in the association between neuroticism and internet addiction. According to our knowledge, this present study is the first to show the mediation role of the perceived stress in the relationship between neuroticism and internet addiction among Indonesian workers.

An explanation of this finding can be found in Bolger and Schilling (1991) who suggested that neuroticism leads people to distress situations by exposing more to stressful events. They have a greater reactivity to those events and are influenced more by unrelated environmental events and therefore they are more likely to engage in the internet to escape from these negative experiences (Zhou et al., 2017).

Furthermore, the result showed that the adaptive coping style moderated the indirect effect relationship between neuroticism and internet addiction through perceived stress ($\beta = -0.023$, $t = -2.335$ $p < 0.05$) supporting our Hypothesis 5. The result showed that the adaptive coping style moderates the mediation effect only in the link between perceived stress and internet addiction (perceived stress X adaptive coping). It shows that even though people may face difficulties and feel distressed with a negative feeling, individuals may have different coping strategies or ways to face those difficulties which can make them tend to internet addiction. The result revealed that migrant workers who tend to react more in positive and adaptive ways to stressful situations seem to be protected from addiction to the internet which is consistent with a previous study showing that positive coping weakened the relationship between a stressful life and internet addiction (Li et al., 2016).

Therefore, we divided the condition of the moderator (i.e. adaptive coping style) into three levels. A higher indirect effect of neuroticism on internet addiction through perceived stress was found in Indonesian workers with a low level of adaptive coping ($B = 0.402$ at -1 SD). A medium indirect effect ($B = 0.300$ at M) was found in Indonesian workers with a mean level of adaptive coping. Whereas Indonesian workers with a high level of adaptive coping had a lower indirect effect of neuroticism on internet addiction via perceived stress ($B = 0.198$ at +1 SD). Overall, these findings revealed that the adaptive coping style moderated the strength of the mediation between neuroticism and internet

addiction via perceived stress, which decreases along with the levels of the adaptive coping style.

This finding is important because it suggests that even though there is a strong relationship between neuroticism and internet addiction through perceived stress among Indonesian migrant workers, the mediation relationship effect is decreased when the Indonesian migrant workers are higher in adaptive coping style. These results are consistent with the stress-coping theory (Carver & Vargas, 2011; Lazarus & Folkman, 1984) which proposed that effective coping could buffer individuals from problem behavior when they are confronted with stressful life events. Moreover, these findings advance our understanding that people may differ in their internet addiction tendency even though they experience similar stressors.

Psychometric Properties
In this study, we used instruments in the Indonesian version. Three scales of our instruments were translated into the Indonesian language (Bahasa Indonesia) including the Perceived Stress Scale (PSS), Internet Addiction Test (IAT), and the Brief COPE of the adaptive coping style. Whereas for the Neuroticism scale, we used an instrument which is already adapted into Bahasa Indonesia.

From our study, we found a good reliability for the Internet Addiction Test (IAT, Cronbach α = 0.86) and Adaptive coping style (Cronbach α = 0.87). Low reliability was found for the Perceived Stress Scale (PSS, Cronbach α = 0.59). To improve the reliability of PSS we omitted three-poorest performing items and the reliability became α = 0.72. Those items deleted were 'positively stated' which means to counter stress, including item 4 "In the last month, how often have you felt confident about your ability to handle your personal problems?", item 5 "In the last month, how often have you felt that things were going your way?" and item 7 "In the last month, how often have you been able to control irritations in your life?" We assume cultural issues might influence the participant to respond to these items and might not be interpreted to measure their perceived stress. So further research needs to investigate the consistency of the Perceived Stress Scale (PSS).

Low reliability was found for the neuroticism scale (Cronbach α = 0.60). The low reliability might be influenced by the number of items (only 8 items) because the values of Cronbach's alpha coefficient are highly influenced by the number of items of the measurement instrument. (Cortina, 1993).

Practical Implication
The study findings provide innovative information to the theoretical model for the pathway of personality especially neuroticism to internet addiction among Indonesian workers in Taiwan and insightful information for the Ministry of Labor in Taiwan, Ministry of Labor in Indonesia in the prevention of internet addiction and promote the mental health among Indonesian workers in Taiwan. First, the findings highlight the importance of neuroticism as a salient characteristic that fosters migrants' workers' perceived stress. Migrant workers with high neuroticism tend to perceive more stress and subsequently, tend to have a high addiction to the internet. Regarding caring for the mental health and well-being of the Indonesian migrant workers, the Ministry of Labor or agency who handles the training program has to pay attention to the role of the neurotic personality on perceiving stress, not only focus on hard-skill training but also focus on the stress management.

Regarding coping style, our results show that the adaptive coping style of Indonesian migrant workers is not correlated with internet addiction and it plays a moderating role between neuroticism and internet addiction through perceived stress. The adaptive coping style could be a protective factor buffering the adverse impact of the stressful condition to internet addiction. It is considered to be a complementing component of the internet addiction prevention program by enhancing adaptive coping to handle problems and stressors.

On the other hand, it is important to note that the protective role of adaptive coping should not be overstated, because even when the Indonesian migrant workers use high levels of adaptive coping style, the association between neuroticism and internet addiction through perceived stress was still significant (albeit will be weaker than those who use a low level of adaptive coping.

5. Conclusion, Limitation and Future Research

It should be noted that this study has certain limitations. First, our study was a cross-sectional study design and we cannot establish any causal inferences about observed associations. Therefore, future studies should use longitudinal data to develop a better path in the theoretical model. Second, the internal consistency estimate for the Indonesian version of 10 items-perceived stress was low (α = 0.59) and consequently we omitted three-poorest performing items and the reliability improved to α = 0.72. The internal consistency for the Indonesian version of the neuroticism scale also was low (α = 0.60) but we kept all the items because it was the best reliability that items could perform. Third, we limited our study in exploring the influence of specific personality characteristics (i.e. neuroticism), but there are other characteristics of

personality (e.g., openness, conscientiousness, extraversion, agreeableness) that need investigation which maybe has different roles on the internet. We considered the adaptive coping style included in the conceptual model as a protective factor, hence the need to investigate the mechanism of specific adaptive coping style (e.g., active coping, instrumental support, planning, acceptance, emotional support, humor, positive reframing, and religion) separately and in detail.

In summary, even though further replication and extensions are needed, this study provides insightful information and findings in investigating how neuroticism relates to internet addiction among Indonesian migrant workers in Taiwan. Moreover, our findings demonstrate the importance of perceived stress as a mediator and adaptive coping style as a mediator in understanding mechanisms linking neuroticism Indonesian migrant workers' internet addiction.

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