Is Perceived Stress of French University Students Related to Personality Traits?

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Introduction and goal: Whilst considering attending university as a potentially stressful situation, and in order to highlight predictors of stress in students, our goal is to assess the link between perceived stress and personality traits in this population. Methodology: We used, via online questionnaires, the perceived stress scale (PSS 10) and the French Big Five Inventory (BFI-Fr). The population consists of French university students (n = 483, Average age = 20.23, σ = 1.99). Results: The results show that 86.3% of students from the sample suffer from anxiety and 79.3% display depressive symptoms according to the PSS-10 scale. The regression model (R^2 = 0.48, $p < 0.000$) shows that conscientiousness (β = -0.2; p = 0.0000) negatively predicts perceived stress, whereas extraversion (β = 0.07; p = 0.03) and neuroticism (β = 0.66; p = 0.0000) predict it positively. Conclusion: The fact that neuroticism and extraversion predict a high level of perceived stress, whereas consciousness predicts a low level of perceived stress in students allows us to consider using this data for preventative and educational approaches to counter stress in this population.

Keywords: personality traits, neuroticism, conscientiousness, perceived stress, student, university

Introduction

The question of university life being a potentially stressful situation has been covered by numerous studies (Boujut & Décamps, 2012; Boujut, Koleck, Bruchon-Schweitzer, & Bourgeois, 2009; Grebot & Barumandzadeh, 2005; Mazé & Verlhiac, 2013; Neveu et al., 2010). According to scientific literature, university students display high levels and rates of psychological distress, such as depression, anxiety, and in particular stress (Furr, Westefeld, McConnell, & Jenkins, 2001; Lafay, Manzanera, Papet, Marcelli, & Senon, 2003; Nerdrum et al., 2006; Neveu et al., 2010; Vandentorren, Verret, Vignonde, & Maurice-Tison, 2005).

Stress can be considered to be determined by two major factors, either situational or individual (Massoudi, 2009). As the latter contains, among others, factors linked to personality, and because this influences the perception of an event such as a challenge or a threat, we think that personality can explain one's vulnerability to stress (Dolan & Arsenault, 2009).

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There are numerous theoretical points of view when it comes to describing personality. The most frequently used unit when studying personality and measuring individual differences is trait (or personal characteristic). At the same time, a consensus seems to exist between the general taxonomy of personality traits (Plaisant, Guertault, et al., 2010) and five personality factors named the "Big Five" developed by Goldberg (Germian, 2008; John & Srivastava, 1999; Plaisant, Guertault, et al., 2010).

There is currently a wide consensus in considering the Big Five model as an important reference in assessing personality (Carver & Connor-Smith, 2010; John & Srivastava, 1999; Plaisant, Courtois, Réveillère, Mendelsohn, & John, 2010). Several studies confirmed its thoroughness and the interest in its utilization (Germian, 2008; Plaisant, Courtois, et al., 2010). To measure the five factors, there are three instruments: TDA, NEO, and BFI (John & Srivastava, 1999). The "Big Five" are namely: E ("Extroversion, Energy, Enthusiasm"), A ("Agreeableness, Altruism, Affection"), C ("Conscientiousness, Control, Constraints"), N ("Negative Feelings, Neuroticism, Nervousness"), and O ("Opening, Originality, Open-mindedness") (Caligiuri, 2000; Cobb-Clark & Schurer, 2011; Kadhem, 2002; Shaqfa, 2011; Shiota, Keltner, & John, 2006). Thus, these factors are collectively referred to by the acronym "EACNO" (Plaisant, Guertault, et al., 2010; Plaisant, Courtois, et al., 2010).

Many studies have taken interest in the relation between personality and mental and physical health (An, Chung, Park, Kim, Kim, & Kim, 2012; Baldwin, Kennedy, & Armata, 2008; Friedman & Booth-Kewley, 1987; Huan, Yeo, Ang, & Chong, 2006; Koleck, Bruchon-Schweitzer, & Bourgeois, 2003; Van Heck, 1997; Vandervoort, 1995). The relation between the five factors and psychopathological problems was, for example, the subject of a meta-analysis in 2005. It was noted that the presence of these problems correlated negatively with conscientiousness, agreeableness, and extraversion, whereas they correlated positively with neuroticism (Malouff, Thorsteinsson, & Schutte, 2005).

More precisely, a study (Vollrath & Torgersen, 2000) carried out upon 683 university students showed that the most neurotic and least conscious student is more likely to be stressed and vulnerable to adopting dysfunctional coping strategies, than the most conscious and least neurotic student. These two factors, according to other studies (Vollrath, 2000), can be seen as predictors of stress in university students. On the contrary, extroversion correlated positively to a low level of stress, and agreeableness had no relation at all with stress.

A third study shows that neuroticism is significantly and positively associated with embarrassment and the frequency of events perceived as stressful by students (Nandrino, Reveillere, Sailly, Moreel, & Beaune, 2003). Moreover, the factors neuroticism (Friedman & Booth-Kewley, 1987; Vandervoort, 1995) and extroversion/introversion are considered pathogenic (Friedman & Booth-Kewley, 1987).

Therefore, extroversion would be predisposed to display positive effects (Magnus, Diener, Fujita, & Pavot, 1993; Watson & Clark, 1992), despite the fact that its effect on stress in one of the studies (Vollrath & Torgersen, 2000) was more ambiguous. The study conducted by Lu (1994) showed that extroversion was negatively associated with stress felt at university, whereas neuroticism was positively associated with it.

The study by Fornés-Vives et al. (2012) and Mazé and Verlhiac (2013) also noted certain associations between the level of stress and the level of neuroticism. A study by Ebstrup, Eplov, Pisinger, and Jørgensen (2011) carried out upon a large sample of individuals aged from 18 to 89 ($n = 3,471$) found a negative relation between perceived stress and four personality traits: extraversion, agreeableness, conscientiousness, and openness to experience, and a positive relation with neuroticism.

Neuroticism is associated with a high risk of stress, unlike extroversion and openness to experience, which are associated with a low risk of stress (Schneider, Rench, Lyons, & Riffle, 2012). The study by Verduyn and Brans (2012) showed that the frequency of negative emotions was the best predictor for neuroticism, while the duration of positive feelings was the best predictor for extraversion. Furthermore, neuroticism would also predict a high level of perceived stress and depression. However, extroversion would negatively predict depression (Mohamadi Hasel, Besharat, Abdolhoseini, Alaei Nasab, & Niknam, 2013). According to two meta-analyses from 2015, agreeableness, extroversion (Chu, Ma, Li, & Han, 2015a), and openness to experience negatively predict the psychological answer to stress, whereas conscientiousness predicts it positively (Chu et al., 2015b).

Neuroticism is a stress predictor in students (Vollrath, 2000). It is significantly and positively linked to embarrassment and the frequency of events seen as stressful by students (Boujut, 2007; Nandrino et al., 2003).

Thus, several studies have established the relation between personality traits and mental health, particularly stress, with occasionally debated results. So what are the predictors of high levels of stress in students? To our knowledge, few studies in France have addressed this issue, nor compared the effects of the "Big Five" personality traits on the level of perceived stress, particularly on populations that require preventive intervention the most, such as university students.

Objective

The main goal was to analyse the links between personality traits according to the Big Five model (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience) and perceived stress. We therefore explored to what extent these traits could predict the levels of stress of university students.

Methodology

Participants

630 subjects answered the questionnaires. After eliminating incomplete answers or subjects that were not aged between 18 and 25 years, 483 students were included in the study. The average age is 20.23 (σ =1.99 years), with a majority of women (73.5%). The sample consists of students currently in every year of studies, from the first year to Ph.D., from various academic disciplines.

Procedure

This article was written within the framework of research on mental health of university students, which began in 2014. The recruitment mainly took place within the Paris West university campus, which advertised our research online. This allowed it to be broadcasted in the student newsletter and on the university's social networks. Posters were also displayed on the campus and via social media. The research was presented as a study concerning mental health of university students, the participation of whom was anonymous and voluntary.

Statistical Analysis

Statistica 12 was used for all statistical analyses. Descriptive analyses (such as percentages, means and standard deviations) were carried out in order to describe the sample population. Subsequently, we carried out bivariate analyses to investigate the possible links between the variables. Finally, logistic regression models

were carried out in order to highlight the variables, which had a significant statistical weight on PSS while taking them all into account.

Results

The level of anxiety and depression according to the PSS-10 scale are shown in Table 1. The correlation coefficients between perceived stress and the Big Five factors are presented in Table 2. In Table 3, the regression model with perceived stress as a dependent variable.

Descriptive Statistics

The average level of perceived stress is 30.48 ($\sigma = 6.17$) according to the PSS-10 scale, with 86.3% of students suffering from anxiety, and 79.3% suffering from depression according to the same scale.

Table 1

Division in % of the Students' Perceived Stress Score

Echelle	Seuil	$n = 483$ %(n)
PSS-10	Anxiety (≥ 24)	86.34% (417)
	Depression (≥ 26)	79.30% (383)

Note. PSS-10: 10-item Perceived Stress Scale.

Correlation between Variables

There is a significant negative correlation between perceived stress and three dimensions of the Big Five: extraversion, agreeableness, and conscientiousness. On the contrary, neuroticism has a significant positive correlation with it.

Table 2

Correlations between Perceived Stress "PSS-10" and the "Big Five" Personality Traits

		1	2	3	4	5	6	7	8
PSS-10									
Perceived stress (global)	1								
Perceived helplessness	2	0.93***							
Perceived self-efficacy	3	0.77***	0.5***						
BFI-Fr									
Extraversion	4	-0.09*	-0.06	-0.13**					
Agreeableness	5	-0.13**	-0.09*	-0.15***	0.02				
Conscientiousness	6	-0.25***	-0.21***	-0.26***	0.08	0.12**			
Neuroticism	7	0.66***	0.61***	0.53***	-0.18***	-0.23***	-0.09*		
Openness to experience	8	-0.08	-0.007	-0.17***	0.18***	0.022	0.02	-0.03	-

Notes. PSS-10: 10-item Perceived Stress Scale; BFI-Fr: 45-item Big Five Inventory Français; $^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$.

Analysis of Regression

The analysis of standard multiple regression to determine the impact of the Big Five personality traits on perceived stress as the dependent variable can be seen in Table 3. This model of regression analysis is significant and supplies a satisfying percentage of explanatory variance for perceived stress: the factors included in this model explained 48% of the variance of perceived stress ($R^2 = 0.48$, $p = 0.000$) ($F(5, 477) = 90.364$, $p = 0.0000$). Extraversion ($\beta = 0.07$; $p = 0.03$) and neuroticism ($\beta = 0.66$; $p = 0.0000$) had a significant positive impact, whereas conscientiousness ($\beta = 0.2$; $p = 0.0000$) had a significant negative impact.

Table 3

Results of Linear Multiple Regression Analyses Using the PSS-10 Score (Perceived Stress) as the Dependent Variable

	Perceived stress: VD $F(5, 477) = 90.364$[***]		
	Beta	Standard error of Beta	*p*
BFI-Fr			
Extraversion	0.07	0.03	0.03[*]
Agreeableness	0.03	0.03	0.24
Conscientiousness	-0.2	0.03	0.000000[***]
Neuroticism	0.66	0.03	0.000000[***]
Openness to experience	-0.04	0.03	0.19

Notes. PSS-10: 10-item Perceived Stress Scale; BFI-Fr: 45-item Big Five Inventory Français; [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$.

Discussion and Conclusion

In this study, we accounted scores revealing a high level of perceived stress compared to the general French population ($M = 23.16$, $ET = 6.81$) (Collange et al., 2013).

In agreement with several previous studies addressing the importance of mental health issues in university students (Boujut et al., 2009; Lafay et al., 2003; Lassarre et al., 2003; Neveu et al., 2010; Strenna, Chahraoui, & Vinay, 2009), our results show that students from our sample ($n = 483$) display high rates of anxiety and depression (scores-threshold PSS-10).

Perceived stress is significantly correlated to four personality factors according to the Big Five which are E (Extraversion), A (Agreeableness), C (Conscientiousness), and N (Neuroticism).

Stress Predictors

We noticed that in the regression analyses results, agreeableness and openness to experience did not have a significant impact on perceived stress.

Nevertheless, neuroticism "positively" predicted most of the variance of perceived stress, in agreement with scientific literature (Ebstrup, Eplov, Pisinger, & Jørgensen, 2011; Mohamadi Hasel et al., 2013; Vollrath, 2000). Conscientiousness, however, predicted it negatively, in agreement with the results from Bartley and Roesch (2011), Besser and Shackelford (2007), and Vollrath (2000) but in disagreement with the results from (Chu et al., 2015b) which found that Conscientiousness predicted stress positively.

The combination of the factors mentioned in this model explained 48% of the variance of perceived stress. Thus, these characteristics can be considered to be factors of vulnerability to stress in students.

These results are coherent with those reported by Vollrath (2000), with the exception of the extroversion factor, which surprisingly appears here as a positive predictor, but whose contribution to the model remains very weak.

There are limitations to our research: a convenience sample, a cross-sectional study and a majority of women. It would be advisable to widen this study to other types of students (schools, "GrandesÉcoles", etc.), and to refine the results by studying the facets of the significant dimensions found in our results.

Conclusion

According to our data, stress, but also anxiety and depression are widespread difficulties in university students. The relation between stress and the "Big Five" can allow us to consider these dimensions as being a

priority to work on in developing preventive programs by insisting on psychosocial skills and emotional management (such as meditation and relaxation). This role obviously requires more research to better determine the effect of each factor.

In the long term, the results of these studies can significantly improve stress prevention, especially in university students, a population who are in particular in need of a method to counter stress.

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