

Determinants of Perceived Stress in Adolescence: The Role of Personality Traits, Emotional Abilities, Trait Emotional Intelligence, Self-Efficacy, and Self-Esteem

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ABSTRACT

The aim of the current study was to examine the explanatory power of personality traits, emotional abilities, trait emotional intelligence, self-efficacy, and self-esteem in predicting perceived stress in adolescents. The data were collected from 406 high school students, aged 18-22 years ($M_{age} = 18.47$, $SD = 0.64$). Perceived stress was assessed with the 10-item Perceived Stress Scale (PSS-10). Personality traits were measured with the Eysenck Personality Short Scale (EPQ-R-S), emotional abilities were assessed with two performance tests, the Emotional Intelligence Scale – Faces (SIE-T), and the Emotion Understanding Test (TRE), and trait emotional intelligence was measured with a self-report questionnaire (the Schutte Emotional Intelligence Scale, SEIS). The Generalized Self-Efficacy Scale (GSES) and the Rosenberg Self-Esteem Scale (RSES) were also used. Results indicate that the strongest determinant of perceived stress in adolescents was high neuroticism. Perceived stress was also determined by low self-efficacy and self-esteem, as well as high extraversion and psychoticism. Women reported higher perceived stress than men. There also were differences in the determinants of perceived stress between graduate and nongraduate students. The obtained results suggest that the development of high self-esteem and high self-efficacy may contribute to perceptions of lower stress in adolescents and may be especially valuable for neurotic individuals and for women, who are more exposed to stress.

KEYWORDS

perceived stress
self-efficacy
self-esteem
personality traits
emotional intelligence

INTRODUCTION

Stress is present in the life of every human being. However, people differ in the number and intensity of the stressors they experience as well as in their responses to them and their appraisals of difficult situations. These appraisals are cognitive processes of giving meaning to a situation and identifying coping capabilities. Individual events may be evaluated as positive, irrelevant, or negative. If the situation is evaluated as negative and threatening for well-being, stressors can then be appraised in terms of threat, loss, or challenge (Lazarus & Folkman, 1984), which can influence the intensity of the perceived stress. These differences in the perception and appraisal of stressful situations are determined by individual differences in various psychological characteristics. Resilience certainly plays the most important role—it enables adaptation to faced adversities and stressful situations (American Psychological Association, 2011).

Liu et al. (2017) proposed the multi-system model of resilience. They distinguished three spherical levels corresponding to different sources of resilience. The central layer includes intraindividual fac-

tors. It constitutes the core resilience and is the base of the individual's overall resilience. The next layer is internal resilience, which includes personal resources acquired over the lifespan, such as personal experience, the impact of family and friends, knowledge, competences, and abilities. The third layer is external resilience, which contains socioecological factors impacting adjustment to stressful situations, like socioeconomic status or access to healthcare. The current study refers to core and internal resilience as factors influencing the intensity of perceived stress in adolescents. Personality traits distinguished by Eysenck can be considered a part of core resilience, whereas emotional abilities, trait emotional intelligence, self-efficacy, and self-esteem can contribute to internal resilience.

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The Role of Personality Traits

Eysenck distinguished three independent personality traits: neuroticism, extraversion, and psychoticism (Eysenck & Eysenck, 1985). Eysenck (1992) argued that psychoticism is directly associated with a tendency towards psychosis, criminal activity, and antisocial behavior. He listed its several components: aggressiveness, coldness, egocentrism, lack of empathy, impulsivity, impersonality, antisocial attitude, tough-mindedness, and creativity (Eysenck & Eysenck, 1985). Psychoticism is related to use of less effective coping strategies like avoidance, self-blame, and fantasizing (Wang & Miao, 2009), and is less amenable to psychotherapy (Eysenck & Eysenck, 1976). Psychoticism is also linked to a pessimistic outlook on life (Howarth, 1986) and emotional states in adolescents (Ciarrochi & Heaven, 2007). Adolescent girls high in psychoticism tend to experience sadness, anxiety, and hostility, while adolescent boys high in psychoticism feel happy less often. Thus, it can be supposed that high psychoticism may be associated with higher perceived stress. Moreover, individuals high in psychoticism have a lower ability to recognize emotions in other people, lower emotional intelligence (Piekarska, 2010), and are less socially adjusted (Wang & Miao, 2009). Those results suggest that individuals high in psychoticism may encounter difficulties in interpersonal relationships, which can be a source of stress. Lack of emotional abilities and social adjustment may result in more frequent interpersonal conflicts, leading to a perception of more intense stress in life.

Neuroticism is related to a high level of negative affect and consists of such traits as anxiety, depressiveness, guilt, irrationality, and tension (Eysenck & Eysenck, 1985). Neurotic individuals have a tendency towards strong emotional reactions when faced with even minor stressors and it is difficult for them to regain balance afterwards (Eysenck & Eysenck, 2006). They are very vulnerable to stress. Earlier studies indicated that neurotic individuals tend to appraise stressful situations as threat and that they experience more interpersonal stressors (Gunther et al., 1999). They also perceive social support as less available (Swickert et al., 2010). High neuroticism is also associated with experiences of more physical symptoms like headaches, nausea, and upset stomach (O'Loughlin et al., 2019). These physical symptoms may be a result of stress (Frost et al., 1986), and on the other hand, the experience of chronic physical symptoms can also be stressful in itself. All these factors may cause neurotic individuals to perceive more stress.

Extraversion consists of such traits as need for stimulation, sociability, activity, and assertiveness (Eysenck & Eysenck, 1985). Extraverted individuals are optimistic and carefree, they laugh often, and prefer risky situations and new experiences. They have many friends and easily make new personal relationships (Eysenck & Eysenck, 2006). They also perceive high availability of social support and are convinced that there are people to talk to about problems and difficult situations (Swickert et al., 2010). It can be supposed that a high level of extraversion can be related to lower perceived stress.

The Role of Trait Emotional Intelligence and Emotional Abilities

Emotional intelligence can be defined as an intellectual ability or as a personality trait. Ability emotional intelligence (AEI) refers to the cognitive abilities that require the use and processing of emotional information, and is measured by performance tests (Mayer et al., 2000). Trait emotional intelligence (TEI) is related to the self-reported perception of own emotional capacities (Di Fabio & Saklofske, 2014). It is a lower-level dimension of personality and is measured by self-report questionnaires (Petrides & Furnham, 2001).

In Mayer and Salovey's (1997; Mayer et al., 2016) theory, AEI is comprised of four branches of mental abilities to: (a) identify emotions, (b) use emotions in thinking and decision making, (c) understand emotions, and (d) manage emotions. The current study focuses on two of these four abilities: emotion recognition in others' faces and emotion understanding. These abilities can play important role in coping in stressful situations (Salovey et al., 1999). Thus, their high level may be associated with lower perception of stress (Piekarska, 2019). Due to the ability to accurately recognize emotions in others, an individual can more easily find a person who will provide support in stressful situations. Accurate perception of others' emotions may also prevent interpersonal conflicts, as mere incorrect recognition of other people's emotional states often leads to interpersonal misunderstandings (Fitness, 2001). High emotion understanding can enable understanding of the causes of emotional states in oneself and others as well as predicting changes in feelings. Individuals with high emotion understanding and emotion recognition may feel more competent and may believe that stressful situations are temporary in life (Gohm et al., 2005). As a result, they may appraise stressors in terms of challenge rather than treat (cf. Schneider et al., 2013; Zeidner et al., 2012). High emotion understanding is also associated with more flexible choice of coping strategies (Davis & Humphrey, 2012). High level of emotion abilities also facilitates stress resilience (Schneider et al., 2013). It may be expected that emotional abilities (emotion perception and emotion understanding) may lead to perception of lower stress in life. However, the results of some studies indicated that a very high level of some emotional abilities may have negative outcomes for adjustment in some circumstances. Individuals with a very high emotion perception may respond worse to daily stress compared to people with lower emotion perception (Ciarrochi et al., 2002). They may have stronger tendency to react with depression symptoms, hopelessness, and suicidal ideation when faced with daily hassles. Focusing very strongly on emotions can also promote rumination (Swinkels, 2000, as cited in Gohm et al., 2005). It can be supposed that a very high level of emotion perception may be maladaptive, especially for individuals with low emotion regulation skills (cf. Matczak, 2007).

It is worth to mention that emotional abilities are potential capacities, which may not be used in practice until they are translated into practical skills (cf. Mikołajczak et al., 2008; Zeidner & Olnick-Shemesh, 2010). Some individuals can also not trust their abilities and that is why may not use them (Gohm et al., 2005). Although emotional abilities should be expected to be related to lower perceived stress, this

relationship should be rather small in size. A stronger association can be expected between TEI and perceived stress. Trait emotional intelligence is conceptualized as a set of emotional competences. It concerns an individual's typical performance (Petrides & Furnham, 2001). Earlier studies showed that TEI is more strongly related to adjustment than AEI. This suggests that the perception and appraisal of own emotional competencies may have a stronger influence on functioning than objectively measured emotional abilities, especially when an individual does not trust them.

Results of earlier studies revealed that high TEI is associated with positive outcomes in stressful situations and that it facilitates adaptation to stressful environments (e.g., Ciarrochi et al., 2002). It may be a protective factor against suicidal thoughts and behaviors and it is related to lower stress in adolescents, even those who are depressed (Adollahi et al., 2016), and it is strongly associated with resilience (Grover & Furnham, 2020). Individuals high in TEI can establish and maintain closer relationships with others so that they can have access to greater social support when faced with adversities (Ciarrochi et al., 2002). They also cope with stress more effectively as high TEI influences coping effectiveness—it's high level increases the positive effects of active coping and reduces the negative effects of avoidant coping (Davis & Humphrey, 2012).

The Role of Self-Efficacy

Self-efficacy theory was proposed by Bandura (1986). Self-efficacy is an optimistic self-belief and trust in own competencies and abilities to cope in different situations and to gain desired effects (Bandura, 1997). It is a disposition which is a personal resource in stress coping (Schwarzer et al., 2005; Schwarzer, & Warner, 2013). It is related to experiencing lower negative emotions in stressful situations and appraising them as challenge rather than loss or threat. Self-efficacy can be considered as one of the factors promoting resilience in difficult situations (Schwarzer & Warner, 2013).

Self-efficacy is not only associated with better adjustment to stressful situations. It is also related to setting challenging goals and motivation to achieve them (Schwarzer & Warner, 2013). Individuals with high self-efficacy believe they are competent and able to deal with the demands in their life. Such a belief may result in less intense perception of stress in life. This is possible because a sense of competence influences the cognitive appraisal of demanding situations and facilitates higher performance and more effective information processing (Bandura, 1997). The results of earlier studies confirmed that high self-efficacy is associated with appraisal of stressful situation as a challenge (Luszczynska et al., 2005).

According to the transactional theory of stress by Lazarus and Folkman (1984), after the primary appraisal of the stressor in terms of threat, loss, or challenge, an individual assesses his or her coping capacities. The secondary appraisal outlines the direction of further actions to cope. Self-efficacy may play an important role in both primary and secondary appraisal leading to a reduction in perceived stress. High self-efficacy individuals will not only evaluate the stressor as a challenge rather than threat or loss (Luszczynska et al., 2005), but will also

feel competent to manage adversities (Bandura, 1997). The perception of a stressor in terms of challenge may reduce perceived stress. Feeling competent supports the choice and use of effective coping strategies, which also may result in lower perceived stress.

The Role of Self-Esteem

Self-esteem is defined as “the degree to which [an individual] holds attitudes of acceptance or rejection toward himself” (Rosenberg, 1962, p. 135). The level of self-esteem has significant consequences for functioning and adjustment. The results of many studies revealed that low self-esteem leads to many problems and difficulties in life (Leary & Baumeister, 2000), and is strongly related to emotional functioning. For instance, low self-esteem is associated with higher anxiety (Guo et al., 2018; Leary & Baumeister, 2000), whereas high self-esteem is related to positive affect and good subjective well-being (Leary & Baumeister, 2000). It also plays an important role in coping with stress (Lazarus & Folkman, 1984). High self-esteem is an important personal resource, which is necessary in adjustment to difficult situation (Steiner et al., 2002). Individuals with high self-esteem use more effective coping strategies (Yildirim et al., 2017). Earlier studies showed that self-esteem is positively related to proactive coping and is negatively related to avoidance coping (Lo, 2002).

Self-esteem also influences the perception of interpersonal relationships. Individuals with low self-esteem are more sensitive to negative evaluation, have a higher need for acceptance, and doubt their interpersonal value, whereas individuals with high self-esteem believe they are liked and accepted by others and that others will react to their needs (Leary & Baumeister, 2000). The results of the earlier studies indicated a positive association between self-esteem and perceived social support (Ikiz & Cakar, 2010; Liu et al., 2018), and the perception of availability of social support in turn improves adjustment (Friedlander et al., 2007).

Positive effects of self-esteem—using more adaptive coping strategies, developing and maintaining satisfying relationships with others, and perceiving social support as available may lead to lower perceived stress in life. Indeed, results of earlier studies confirmed that adolescents with a high level of self-esteem perceive lower school stress (Guo et al., 2018). However, it can be expected that in adolescents, high self-esteem is associated with lower perceived stress in general, not only in school.

Emotional Intelligence, Self-Efficacy, and Self-Esteem as Mediators

Based on the existing literature, it can be expected that perceived stress will be related the most strongly to neuroticism. Neuroticism, being a part of core resilience, is the base of overall resilience across the lifespan (cf. Liu et al., 2017) and may inherently lower resilience. However, resilience also has different sources, not only relatively stable traits. It is also created by individual dispositions that are acquired during the lifespan and through personal experience, creating internal resilience (Liu et al., 2017). These dispositions may include emotional

intelligence, self-efficacy, and self-esteem. In the literature, attention is paid that emotional intelligence, self-efficacy, and self-esteem facilitate adjustment in difficult situations (e.g., Salovey et al., 1999; Steiner et al., 2002; Schwarzer & Warner, 2013). Thus, the question arises whether traits belonging to internal resilience (emotional intelligence, self-efficacy, and self-esteem) can reduce the negative impact of neuroticism on resilience. It can be supposed that their development may compensate for neuroticism (cf. Kagan, 1998). Resilience is a dynamic, multidimensional process continuing throughout the lifespan (Liu et al., 2017). It is an interactive process between stressful experience and factors from all three levels of resilience: core, internal, and external. Thus, it can be expected that traits belonging to internal resilience (emotional intelligence, self-efficacy, and self-esteem) can mediate the relationship between neuroticism and perceived stress.

The Current Study

Adolescence is a critical period in which the occurring transitions can cause psychological stress and emotional instability what is characteristic for this time. Compared to children and adults, adolescents show stronger amygdala activity (Hare et al., 2008), which can cause their tendency towards stronger reactions to psychosocial stress. For adolescents, peers and peer group belongingness take on a heightened significance, as they influence their self-perception and can also be a source of social support. Adolescents are very sensitive to social evaluation (Somerville, 2013) and peer acceptance (Badener-Ribera et al., 2019), and often experience fear of missing out (Fabris et al., 2020). During adolescence, susceptibility to negative emotional stimuli increases and sensitivity to positive emotional stimuli decreases (Yang et al., 2018). Additional sources of stress in adolescence can be school, especially the period when grades are issued and important exams are taking place. Thus, adolescents are exposed to many stressors, and it is important to determine personal resources of their resilience that may influence their perception of stress.

The current study is a part of a broader research project. The aim of the current study was to determine the correlates of perceived stress in adolescents. In particular, the purpose of the study was to verify whether the relationship between neuroticism and perceived stress is mediated by factors belonging to internal resilience (emotional intelligence, self-efficacy, and self-esteem). The detailed goal of the current study also was to investigate the explanatory power of personality traits, emotional abilities, TEI, self-efficacy, and self-esteem in predicting stress perceived by adolescents.

METHODS

Participants

Four hundred and six high school students, aged 18–22 years ($M_{\text{age}} = 18.47$, $SD = 0.64$) participated in the study. The sample comprised 211 women (52%) and 195 men (48%). The women were 18–22 years old ($M_{\text{age}} = 18.45$, $SD = 0.64$) and the men were 18–21 years old ($M_{\text{age}} = 18.48$, $SD = 0.64$). Participants were in their final year of high school

(graduate students; 314, 77,3%) or were in lower grade (nongraduate students; 88, 21,7%; 4 missing data). All participants were from Poland.

Measures

PERCEIVED STRESS

Perceived stress was assessed with the 10-item Perceived Stress Scale (PSS-10; Cohen et al., 1983) in the Polish adaptation by Juczyński and Ogińska-Bulik (2009). The PSS-10 measures the stress perceived in the last month. Participants indicate on a 5-point Likert-type scale (0 = *never*, 4 = *very often*) how often in the last month they felt in a given way. The scores range from 0 to 40. Cronbach's α for the Polish adaptation was .86.

SELF-EFFICACY

Self-efficacy was measured with the Generalized Self-Efficacy Scale (GSES) by Schwarzer and Jerusalem (Schwarzer, 1993) in Polish adaptation by Schwarzer et al. (Juczyński, 2009). Participants give their answers to the items on a 4-point Likert-type scale indicating if they agree with each statement (1 = *no*, 4 = *yes*). The GSES consists of 10 items and the scores range from 10 to 40. Cronbach's α for the Polish adaptation was .85.

SELF-ESTEEM

Self-esteem was assessed with the Rosenberg Self-Esteem Scale (RSES) in the Polish adaptation by Dzwonkowska et al. (2008). The RSES consists of 10 items. Participants indicate how much they agree with each of the statements on a 4-point Likert-type scale (1 = *strongly agree*, 4 = *strongly disagree*). The scores range from 10 to 40. Cronbach's α for the Polish adaptation ranged from .81 to .83.

PERSONALITY TRAITS

Personality traits were measured using the Eysenck Personality Short Scale (EPQ-R-S; Eysenck & Eysenck, 2006) in the Polish adaptation by the Psychological Test Laboratory of the Polish Psychological Association (Jaworowska, 2012). The EPQ-R-S consists of 48 items and enables counting scores on four scales: neuroticism, extraversion, psychoticism, and lie. Each scale consists of 12 items. The scores on each scale range from 0 to 12. The reliability of the Polish adaptation, assessed by the stability coefficients, was .81 for neuroticism; .85 for extraversion; .73 for psychoticism and .83 for lie.

EMOTIONAL ABILITIES

Emotional abilities were measured using two performance tests: the Emotional Intelligence Scale–Faces (SIE-T; Matczak et al., 2005) and the Emotion Understanding Test (TRE; Matczak & Piekarska, 2011).

The SIE-T is based on Mayer and Salovey's (1997) concept of AEI and it measures facial emotion recognition ability. It consists of 18 color photographs of male and female faces. To each photo are listed six emotion names. Participants decide if each of six listed emotions is expressed on the face using one answer: expressed, not expressed,

difficult to say (for example item, see Laskowska et al., 2015). One point is given for each correct answer. The scores range from 0 to 108.

Cronbach's α was .77 for female and .83 for male high school students. In validated studies, the SIE-T showed, for example, moderate associations with fluid intelligence, the Polish version of the Multifactor Emotional Intelligence Scale (MEIS; Matczak et al., 2005), and emotion understanding ability. In other studies, correlations between the SIE-T and the Emotional Intelligence Test (TIE; a Polish ability emotional intelligence test based on Mayer and Salovey's concept) were observed (Śmieja et al., 2014; Wojciechowski et al., 2014).

The TRE is based on Mayer and Salovey's (1997) concept of AEI. It measures emotion understanding ability. It consists of five parts, and each contains six items. In Part 1, participants sort four given emotions in order from weakest to strongest. In Parts 2-5, they select one answer from a given set of four. In Part 2, they indicate the opposite emotion to the given one. In Part 3, they choose the emotion that is the component of the given emotion. In Part 4, they select the emotion that appears in the described situation. In Part 5, they indicate the conditions under which the given emotional reaction will most likely appear in the described situation. One point is given for each correct answer. The scores range from 0 to 30.

Cronbach's α for the TRE was .83 in men and ranged from .80 to .81 in women aged 15 to 25 years. Factor analyses revealed the existence of one scale. In validation studies were observed, for instance, primarily moderate correlations with the Polish version of the MEIS, emotion recognition ability, social intelligence, and fluid intelligence, low and moderate correlations with the Polish version of the Schutte Emotional Intelligence Scale (SEIS; Jaworowska & Matczak, 2008), and insignificant or moderate associations with temperamental traits.

TRAIT EMOTIONAL INTELLIGENCE

Trait emotional intelligence was assessed with the Schutte Emotional Intelligence Scale (SEIS; Schutte et al., 1998) in the Polish adaptation of Ciechanowicz et al. (Jaworowska & Matczak, 2008). The SEIS is a self-report questionnaire based on the first model of emotional intelligence proposed by Salovey and Mayer (1990). It consists of 33 items. Participants indicate how much they agree with each item on a 5-point Likert-type scale (1 = *definitely disagree*, 5 = *definitely agree*). The scores range from 33 to 165. Cronbach's α for the Polish version was .82 for female and .84 for male high school students.

Procedure

The study was conducted in groups in school classrooms during normal school days. Participation was anonymous and voluntary. Before the study began, verbal informed consent was obtained from all participants. All participants were informed of their right to withdraw from the study at any time without any consequences. They were also informed that the study concerned perceived stress and the role of personality, emotional skills, and other traits useful in coping with difficulties. They were given verbal instructions on how to complete the tests and the questionnaires and were also asked to read all instructions in test booklets. They were asked to answer all questions individually. The

participants had the option of receiving their personal results regarding their emotional abilities. The study was conducted at the end of the school year, when school stress might have been higher, as this was the period of final grades and exams, including the matriculation exam for the graduate students.

RESULTS

Perceived Stress and Sociodemographic Variables

Gender differences in the measured variables were assessed by *t*-tests (see Table 1). Women received higher scores on perceived stress ($d = 0.54$), neuroticism ($d = 0.75$), emotion recognition ($d = 0.33$), and emotion understanding ($d = 0.22$) than men. Men received higher scores in psychoticism ($d = 0.51$), self-efficacy ($d = 0.33$), and self-esteem ($d = 0.21$). Medium effect sizes for perceived stress, neuroticism, and psychoticism were found, whereas small effect sizes were found for emotion recognition, emotion understanding, self-efficacy, and self-esteem.

Differences in stress perceived by graduate and nongraduate students were assessed using Mann-Whitney's *U* test. The results showed a significant difference between the groups ($U = 8996.50$, $p < .001$). Graduate students perceived significantly higher stress ($M = 20.89$, $SD = 7.11$) compared to nongraduate students ($M = 17.65$, $SD = 8.18$). The effect size was moderate ($d = 0.42$).

Correlates of Perceived Stress

Spearman's ρ correlation coefficients were calculated to examine the relationships between the measured variables in the total sample (see Table 2). Perceived stress was strongly and positively associated with neuroticism and negatively related to self-esteem (large correlation), self-efficacy, trait emotional intelligence (moderate correlation), and extraversion (small correlation).

TABLE 1.

Descriptive Statistics of the Measured Variables

Variable	Total sample		Women		Men		t
	M	SD	M	SD	M	SD	
S	20.19	7.43	21.98	6.81	18.10	7.60	5.267***
N	6.92	3.62	8.13	3.23	5.57	3.57	7.422***
E	7.89	3.47	7.92	3.51	7.85	3.44	.182
P	3.79	1.88	3.36	1.70	4.28	1.97	-4.946***
ER	71.71	11.19	73.47	10.35	69.84	11.76	3.289**
EU	17.88	3.75	18.27	3.76	17.45	3.70	2.215*
TEI	119.76	14.43	120.87	13.14	118.57	15.66	1.597
GSE	30.14	4.51	29.44	4.44	30.90	4.47	-3.276**
SE	28.48	5.27	27.95	5.20	29.06	5.29	-2.109*

Note. S = perceived stress; N = neuroticism; E = extraversion; P = psychoticism; ER = emotion recognition; EU = emotion understanding; TEI = trait emotional intelligence; GSE = general self-efficacy; SE = general self-esteem.

*** $p < .001$; ** $p < .01$; * $p < .05$.

TABLE 2.Spearman's ρ Coefficients Between the Measured Variables in the Total Sample

	S	N	E	P	ER	EU	TEI	GSE
N	.68**							
E	-.14**	-.15**						
P	-.06	-.17**	-.01					
ER	.03	-.01	.00	.01				
EU	.05	.01	-.06	-.11*	.33***			
TEI	-.33***	-.30***	.42***	-.13**	.06	.06		
GSE	-.46***	-.46***	.33***	.10	-.05	-.02	.54***	
SE	-.55***	-.54***	.38***	.06	.06	.04	.50***	.60***

Note. S = perceived stress; N = neuroticism; E = extraversion; P = psychoticism; ER = emotion recognition; EU = emotion understanding; TEI = trait emotional intelligence; GSE = general self-efficacy; SE = general self-esteem.

*** $p < .001$; ** $p < .01$; * $p < .05$.

Mediators of the Neuroticism–Perceived Stress Relationship

Three mediation analyses were conducted to examine whether the relationship between neuroticism and perceived stress is mediated by TEI, self-efficacy, and self-esteem. Emotion recognition ability and emotion understanding ability were not considered as mediators as they were not associated with perceived stress and neuroticism in the current study. The significance of the mediation analyses was tested by Sobel's test. The results indicated that the association between neuroticism and perceived stress was partially mediated by TEI ($Z = 3.08$, $p < .01$), self-efficacy ($Z = 5.04$, $p < .001$), and self-esteem ($Z = 6.15$, $p = .001$). Although neuroticism was strongly associated with perceived stress in the mediation models, the mediators (TEI, self-efficacy, and self-esteem) reduced the impact of neuroticism and were negatively associated with perceived stress.

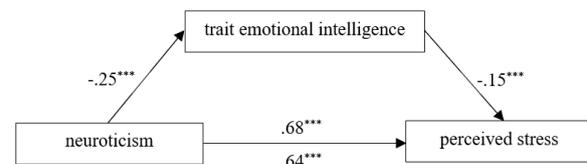
Predictors of Perceived Stress—Hierarchical Regression Analyses

The significant predictors of perceived stress were examined using a hierarchical regression analysis (see Table 3). Gender was included in Step 1, personality traits in Step 2, emotional abilities in Step 3, TEI in Step 4, and self-efficacy and self-esteem in Step 5. Gender was a significant predictor of perceived stress in Step 1. In Steps 2 and 3, neuroticism was the only predictor of perceived stress. In Step 4, gender and TEI added significantly to the regression model. In Step 5, perceived stress was predicted by gender, neuroticism, extraversion, psychoticism, self-efficacy, and self-esteem.

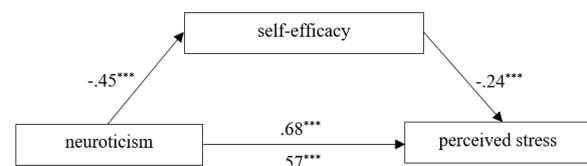
The hierarchical regression analyses were also conducted separately for the graduate students and nongraduate students, as a preliminary analysis indicated statistically significant differences in perceived stress between these groups (see Table 4). Results showed differences in the determinants of perceived stress in both groups. In graduate students, higher perceived stress was predicted by higher neuroticism, extraversion, psychoticism, and lower self-esteem. However, in nongraduate students, higher perceived stress was determined by higher neuroti-

cism and lower self-efficacy. Neuroticism was the stronger predictor of perceived stress in nongraduate students compared to graduate students.

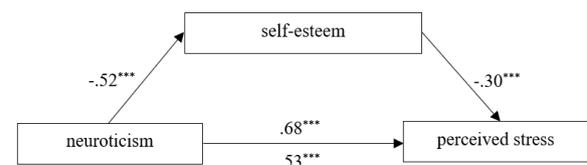
The results of hierarchical regression analyses indicated that neuroticism, self-efficacy, and self-esteem were the strongest predictors of perceived stress. Thus, interactions between neuroticism and self-efficacy and between neuroticism and self-esteem were tested in the hierarchical regression analyses. The analyses were conducted on the total sample, as well as on graduate students and nongraduate students separately. Scores on neuroticism, self-efficacy, and self-esteem were mean-centered (standardized). Next, the interaction terms of neuroticism \times self-efficacy and neuroticism \times self-esteem were created. For the total sample, neuroticism, self-efficacy, and self-esteem were entered as predictors in Step 1. In Step 2, the interaction terms of neuroticism \times self-efficacy and neuroticism \times self-esteem were added. In the regression analysis for graduate students, neuroticism and self-esteem were first entered as predictors, and the interaction term of neuroticism \times self-esteem was added in Step 2. For nongraduate students, neuroticism and self-efficacy were inputted entered in Step 1, and the interaction term of neuroticism \times self-efficacy was added in Step 2. The results indicated no interaction between neuroticism and self-esteem and between neuroticism and self-efficacy (see Table 5).

**FIGURE 1.**

The relationship between neuroticism and perceived stress, mediated by trait emotional intelligence.

**FIGURE 2.**

The relationship between neuroticism and perceived stress, mediated by self-efficacy.

**FIGURE 3.**

The relationship between neuroticism and perceived stress, mediated by self-esteem.

TABLE 3.

Hierarchical Regression for Gender, Personality Traits, Emotional Abilities, Trait Emotional Intelligence, Self-Efficacy, and Self-Esteem as Predictors for Perceived Stress

Predictor	R ²	ΔR ²	Beta
Step 1	.068***	.068***	
Gender			-.26***
Step 2	.461***	.394***	
Gender			-.07
N			.66***
E			-.02
P			.06
Step 3	.463***	.002	
Gender			-.06
N			.66***
E			-.02
P			.07
ER			-.01
EU			.04
Step 4	.487***	.024***	
Gender			-.08*
N			.62***
E			.06
P			.04
ER			.00
EU			.06
TEI			-.18***
Step 5	.554***	.067***	
Gender			-.08*
N			.48***
E			.14**
P			.08*
ER			.00
EU			.06
TEI			-.04
GSE			-.13*
SE			-.28***

Note. S = perceived stress; N = neuroticism; E = extraversion; P = psychoticism; ER = emotion recognition; EU = emotion understanding; TEI = trait emotional intelligence; GSE = general self-efficacy; SE = general self-esteem.

*** $p < .001$; ** $p < .01$; * $p < .05$.

DISCUSSION

The aim of the current study was to assess the explanatory power of personality traits, emotional abilities, TEI, self-efficacy, and self-esteem in predicting perceived stress in adolescents. The obtained results are mostly in accordance with the hypotheses. The strongest predictor of perceived stress was neuroticism. This result is in accordance with earlier studies showing that high neuroticism is associated with negative emotional outcomes of stressful situation (e.g., Engelhard et al., 2009; Saigh et al., 2016) and low resilience (Di Fabio & Saklofske, 2018). Associated with high neuroticism, the tendency towards strong emotional reactions, negative affectivity, and difficulty in regaining balance in difficult situations (Eysenck & Eysenck, 1985, 2006) leads to perception of higher stress in life.

Self-esteem was a moderate predictor of perceived stress. This result is in accordance with earlier studies indicating that high self-esteem is associated with better adjustment and emotional functioning (e.g., Guo et al., 2018; Leary & Baumeister, 2000; Steiner et al., 2002). General self-acceptance may lead to perception of lower stress in life. As individuals with high self-esteem use more adaptive coping strategies (Yildirim et al., 2017) and have more satisfying interpersonal relationships (Leary & Baumeister, 2000), which can be a source of support, it might be easier for them to regain balance in stressful situation.

The smallest predictors of perceived stress were extraversion, self-efficacy, psychoticism, and gender. The obtained results indicated that women perceive higher stress than men. This is in accordance with earlier studies (e.g., Hampel & Petermann, 2006; Leventhal et al., 2017; Matud, 2004). This difference may be explained among others by the fact that women are usually more engaged emotionally in affairs of other people than men and that they experience more violence and discrimination (Matud, 2004). It may also be a result of differences in coping strategies used by men and women (e.g., Piekarska, 2015; Skuzińska et al., 2019).

As was expected, higher self-efficacy was related to lower perceived stress. This suggests that high self-efficacy can be a source of resilience in adolescents (cf. Schwarzer & Warner, 2013). Individuals with high self-efficacy appraise stressful situation as challenge (Luszczynska et al., 2005), which can lead to lower perceived stress. Earlier studies also suggested that high self-efficacy may promote adjustment to new and difficult situation. For instance, Law et al. (2019) reported that high self-efficacy lowers the stress experienced by first-time mothers in the first 6 months of motherhood. Results of the study conducted by Luszczynska et al. (2009) revealed that high self-efficacy can facilitate posttraumatic adaptation. Experiencing difficulties in life sometimes fosters changes in behavior and habits in order to adapt to new situations. Self-efficacy may be helpful in such circumstances because optimistic self-beliefs about own capacities to change may facilitate goal reaching and plan implementation (cf. Gutiérrez-Doña et al., 2009).

Extraversion was expected to be negatively related to perceived stress. The results of the correlation and regression analyses were contradictory. While the correlation analysis showed a negative association between extraversion and perceived stress, the regression analysis revealed that high extraversion may, in some circumstances, be associated with higher perceived stress. Extraverted individuals have a need for stimulation, are impulsive, and prefer risky situations (Eysenck & Eysenck, 2006). Individuals high in both extraversion and neuroticism may tend to react with aggression, be impatient, and irritable (Eysenck & Eysenck, 2006). They are also characterized by heightened affective variability (Dauvier et al., 2019). This may explain the regression analysis results suggesting that higher extraversion is associated with higher perceived stress. Moreover, earlier studies reported that neuroticism and extraversion are positively related to concern for others' happiness in adolescents, which can be viewed as a component of empathy (Francis et al., 2010). Emotional empathy manifests in empathic concern and personal distress (Davis, 1996). Personal distress is a self-focused variable related to the tendency to react with anxiety and

TABLE 4.

Hierarchical Regressions for Gender, Personality Traits, Emotional Abilities, Trait Emotional Intelligence, Self-Efficacy, and Self-Esteem as Predictors for Perceived Stress in Graduate and Nongraduate Students

Predictor	Graduate students			Nongraduate students		
	R ²	ΔR ²	Beta	R ²	ΔR ²	Beta
Step 1	.057***	.057***		.038	.038	
Gender			-.24***			-.20
Step 2	.404***	.347***		.664***	.626***	
Gender			-.08			.09
N			.62***			.841***
E			-.02			-.02
P			.09			.01
Step 3	.404***	.000		.670***	.006	
Gender			-.08			.11
N			.62***			.85***
E			-.02			-.03
P			.09			.03
ER			-.01			.03
EU			.00			.07
Step 4	.436***	.032***		.687***	.017	
Gender			-.10*			.10
N			.55***			.83***
E			.08			.01
P			.06			.00
ER			-.02			.06
EU			.02			.07
TEI			-.22***			-.15
Step 5	.511***	.074***		.741***	.054**	
Gender			-.09			.08
N			.43***			.65***
E			.15**			.13
P			.09*			.01
ER			-.01			.03
EU			.04			.02
TEI			-.07			.00
GSE			-.06			-.25*
SE			-.34***			-.17

Note. S = perceived stress; N = neuroticism; E = extraversion; P = psychoticism; ER = emotion recognition; EU = emotion understanding; TEI = trait emotional intelligence; GSE = general self-efficacy; SE = general self-esteem.

*** $p < .001$; ** $p < .01$; * $p < .05$.

fear when exposed to others' suffering. Compassion for the suffering of others may lead to perception of higher stress. Concern for others' happiness in situations when it is impossible to improve it may also lead to more intense negative emotions and may result in higher perceived stress in neurotic and extraverted individuals.

The regression analysis also showed that psychoticism is one of the determinants of perceived stress. This result is in accordance with an earlier study which showed a negative relationship between psychoticism and resilience in young adults (Di Fabio & Saklofske, 2018). Impulsivity and self-defeating lifestyle characteristics for psychoticism are also associated with personal distress (Szabó & Bereczkei, 2017). Earlier studies also showed that high psychoticism is associated with

hopelessness, suicidal ideation, and suicide attempts (Lolas et al., 1991), lower happiness, lower positive affect, lower life satisfaction, lower quality of life, higher negative affect (Steel et al., 2008), and a lack of purpose in life (Pearson & Sheffield, 1989). Such correlates may contribute to the positive association between psychoticism and perceived stress.

Contrary to expectations, emotional abilities were not associated with perceived stress. Trait emotional intelligence was negatively correlated with perceived stress, although the last step of the regression analyses showed that after self-efficacy and self-esteem were added to the model, TEI became unrelated to perceived stress. This suggests that self-efficacy and self-esteem play a more important role in lowering perceived stress than TEI.

Although in the current study, general stress perceived in the last month was measured it can be assumed that it also included school stress. In graduate students, it could be associated with fear about the matriculation exams or, for some students, with fear and uncertainty about being admitted to this exam. In nongraduate students, it could be related to issuing grades at the end of the school year and promotion to the next grade. Graduate students perceived higher stress compared to nongraduate students. Upcoming matriculation exams or uncertainty about being admitted to it is more stressful than promotion to the next grade. The regression analyses conducted separately for graduate and nongraduate students indicated that there are differences in predictors of perceived stress in both groups. In graduate students, higher perceived stress was determined by higher neuroticism, extraversion, psychoticism, and lower self-esteem, whereas in nongraduate students, it was predicted only by neuroticism and self-efficacy. Neuroticism was the stronger predictor of perceived stress in nongraduate students compared to graduate students. These results suggest that different factors can be significant for stress perception in different situations. In less stressful situations, like those concerning promotion to the next grade, neuroticism plays the most important role—it is very strongly associated with perceived stress. The impact of neuroticism in less stressful situations may be reduced by high general self-efficacy. In more stressful situations, like upcoming matriculation exams, neuroticism also predicts perceived stress. However, it is not as strong a determinant as in less stressful circumstances. The impact of neuroticism in more stressful situations may be particularly reduced by high self-esteem, and when self-esteem is not taken into account, by high TEI.

The results of the current study suggest that self-efficacy and self-esteem are independent predictors of perceived stress in adolescents. The hierarchical regression analyses indicated that there is no interaction between neuroticism and self-efficacy as well as between neuroticism and self-esteem, while the mediation analyses indicated that self-efficacy and self-esteem may reduce the predictive power of neuroticism in stress perception in adolescents.

CONCLUSIONS

Neuroticism, extraversion, and psychoticism are mostly determined genetically (Eysenck & Eysenck, 2006). They can be considered as parts of core resilience, which is the base of overall resilience. The results of the current study suggest that genetically determined personality traits

TABLE 5.

Hierarchical Regressions for Perceived Stress in the Total Sample, Graduate Students, and Nongraduate Students

Predictor	Total sample			Graduate students			Nongraduate students				
	R ²	ΔR ²	Beta	Predictor	R ²	ΔR ²	Beta	Predictor	R ²	ΔR ²	Beta
Step 1	.533***	.553***		Step 1	.492***	.492***		Step 1	.719***	.719***	
N			.51***	N			.47***	N			.65***
GSE			-.12*	SE			-.34***	GSE			-.32***
SE			-.23***								
Step 2	.538***	.005		Step 2	.492***	.000		Step 2	.719***	.000	
N			.50***	N			.47***	N			.65***
GSE			-.13**	SE			-.34***	GSE			-.32***
SE			-.23**	N × SE			-.01	N × GSE			.01
N × GSE			.09					GSE			
N × SE			-.09								

Note. S = perceived stress; N = neuroticism; E = extraversion; P = psychoticism; ER = emotion recognition; EU = emotion understanding; TEI = trait emotional intelligence; GSE = general self-efficacy; SE = general self-esteem.

*** $p < .001$; ** $p < .01$; * $p < .05$.

are associated with perceived stress and the strongest determinant of perceived stress is high neuroticism. However, after adding other variables to the regression analysis, the contribution of neuroticism to perceived stress decreased. This suggests that other variables (especially self-efficacy and self-esteem) may reduce the influence of high neuroticism on perceived stress.

Perceived stress was also determined by low self-efficacy and self-esteem, which can be viewed as components of internal resilience. The obtained results suggest that high self-esteem and self-efficacy can be viewed as factors which can reduce the negative influence of genetically determined personality traits (especially neuroticism) on perceived stress. High self-efficacy may lead to lower perceived stress in less stressful circumstances while high self-esteem may reduce perceived stress in more stressful situations. The development of high self-esteem and high self-efficacy may contribute to the perception of lower stress in life and may be especially valuable for neurotic individuals and women, who are more exposed to stress.

The results of the study indicated that extraversion may be positively associated with perceived stress in some circumstances. Future research could examine how individuals with different configurations of personality traits (extraversion, neuroticism, and psychoticism) perceive stress.

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