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Selected personality correlates of procrastination in Polish adolescents–preliminary report

Wybrane osobowościowe korelaty prokrastynacji u polskiej młodzieży – doniesienie wstępne[1]

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Abstract: Procrastination, or intentional delay, is a phenomenon that makes the functioning of young people harder.Recently, this issue has been given a lot of attention in psychology and education sciences. Students who delay various activities may experience negative emotions and problems related to psychological health and daily functioning. This research aims to examine the links between selected personality traits (in the Big Five model and underlying autism spectrum disorder) and the propensity for engaging in procrastination behaviours. The research involved 530 primary school students (seventh- and eight-graders), aged from 13 to 15 years (M = 13.8, SD = 0.48; 58.5% females and 41.5% boys). During adolescence, various non-adaptive personality traits may contributeto the development of procrastination, which makes it harder for adolescents to make choices, decisions or fulfill their duties in a timely manner. The research makes use of the following methods: the Ten-Item Personality Inventory (TIPI); Polish version by Łaguna, Bąk, Purc, Mielniczuk, Oleś, 2014; the Pure Procrastination Scale (PPS) by Steel, 2010; Polish adaptation by Stępień,Cieciuch, 2013; amended by Stępień, Topolewska, 2014, and the Autism-Spectrum Quotient (AQ) Adolescent Version by Barron-Cohen et al., 2006; Polish version by Pisula, Rynkiewicz, Łucka, 2010. The research results show that conscientiousness, agreeableness, and emotional stability are significant predictors of procrastination in early adolescence. It was found there is a significant association between agreeableness and generalised tendency to procrastinate in terms of decision-making and non-adaptation in boys. The results obtained can be useful in the formulation of guidelines for parents and teachers planning and organising the work of students who have problems meeting school demands.
Keywords: adolescence, education, procrastination, Big Five, autism disorder's spectrumtraits

Abstrakt: Prokrastynacja, czyli intencjonalne zwlekanie jest zjawiskiem utrudniającym funkcjonowanie młodych osób. W ostatnim czasie zagadnienie to stało się niezwykle popularne na gruncie psychologii i pedagogiki. Uczniowie, którzy zwlekają z realizacją różnych ważnych działań mogą doświadczać negatywnych emocji, a niekiedy problemów ze zdrowiem psychicznym. Celem badania było określenie związków pomiędzy wybranymi cechami osobowości (w modelu Wielkiej Piątki oraz spectrum autyzmu) a skłonnością do podejmowania zachowań prokrastynacyjnych. W badaniu wzięło udział 530 uczniów (młodzież siódmej i ósmej klasy szkoły podstawowej). Zakres wiekowy uczestników badania wynosił od 13 do 15 lat (M = 13,8; SD = ,48; w tym 58,5% dziewcząt i 41,5% chłopców). W okresie dorastania cechy osobowości i cechy ze spectrum autyzmu mogą przyczyniać się do rozwoju prokrastynacji, która utrudnia adolescentom dokonywanie wyborów, podejmowanie decyzji czy terminowe wywiązywanie się ze zobowiązań. Metodami wykorzystanymi w badaniu były: Ten Item Personality Inventory (TIPI–polska wersja narzędzia; Łaguna, Bąk, Purc, Mielniczuk, Oleś, 2014), Pure Procrastination Scale (PPS–Steel, 2010; w polskiej adaptacji Stępień i Cieciuch, 2013, z poprawkami Stępień i Topolewska, 2014) oraz The Autism-Spectrum Quotient (AQ) Adolescent Version (Barron-Cohen i współpracownicy, 2006; w polskiej wersji Pisula, Rynkiewicz, Łucka, 2010). Wyniki wskazują, że sumienność, ugodowość i stabilność emocjonalna są istotnymi predyktorami prokrastynacji u młodzieży w okresie wczesnej adolescencji. W przypadku chłopców stwierdzono istotny związek między ugodowością a uogólnioną skłonnością do prokrastynacji w aspekcie decyzyjnym i nieadaptacyjnym. Uzyskane wyniki stanowią wkład w formułowaniu wskazówek dla rodziców i nauczycieli w planowaniu i organizowaniu pracy uczniów doświadczających problemów w wypełnianiu zobowiązań szkolnych.
Słowa kluczowe: adolescencja, edukacja, prokrastynacja, Wielka Piątka, cechy ze spektrum autyzmu

1 Artykuł w języku polskim: https://www.stowarzyszeniefidesetratio.pl/fer/2023-1Dack.pdf

Introduction

Adolescence is a period in a person's life characterised by biological, cognitive and social changes (Sawyer, Azzopardi, Wickremarathne, Patton, 2018). Young people strive for greater independence from their parents, and their peer group begins to play an increasing role in meeting their needs related to their growing sense of belonging, self-discovery and development of interpersonal skills (Crone, Achterberg, 2022; de Moor, van der Graaff, van Dijk, Meeus, Branje, 2019; Veenstra, Laninga-Wijnen, 2022). Profound changes affect also personality traits, which shape every human being's unique perception of reality, interpretation of causes of events and emotions associated with them (Etkin, De Caluwé, Ibánez, Ortet, Mezquita, 2022; Meeus, 2019). Young people's personality develops intensively through interaction with others, in situations involving new challenges and social roles that accompany children in their transition to adolescence (Grummitt, Barrett, Kelly, Stapinski, Newton, 2022; Schwaba, Bleidorn, Hopwood, Manuck, Wright, 2022). School is a place where adolescents spend a great deal of time, so its significance for their daily functioning can be said to match that of the workplace to adults. It is here, at school, that young people discover who they are and how they are perceived by others through their contact with peers and teachers (Israel et al., 2022). In school context, pupils get to know their personal resources that are important for the way they deal with failure, criticism, and their definition of what is important to them. Young people learn how to make assessments and act in specific situations, either when succeeding or failing (Bono, Dufy, Moreno, 2022). Besides relations with peers, a significant role is played here by the entirety of present and past interactions of the child with her caregivers (typically parents), and also other significant persons from the closest environment (Whitaker, Dearth-Wesley, Herman, van Wingerden, Winn, 2022).

Another important area of change during adolescence is the task-oriented competences of young people (Zlotnik, Gal, Weiss, 2022). They learn to plan their actions, reflect on the decisions they make, and assess the possibilities of attaining important goals. It should be noted that the goals of teenagers today are rather closely related to their school achievements (Holzer, Korlat, Bürger, Spiel, Schober, 2022; Karababa, 2022). Studies show that school achievements are an essential aspect of young people's positive self-evaluation and general well-being because satisfactory academic achievements imply a range of rewards, such as public praise or perks (Holzer et al., 2022; Orth, Robins, 2022; Karababa, 2022). For such reasons, young people develop many habits linked to their task-oriented functioning, for example, conscientious work in the face of various distractors, or day-planning associated with organising their time spent on both learning and recreation (Cardoso, Duarte, Pacheco, Janeiro, 2022). Such habits determine their task efficiency and how effectively they perform various duties while deriving satisfaction from the lifestyle they have chosen (Orth, Robins, 2022). Perpetuation of wrong habits, for example, through avoiding confrontation with difficult situations or a delayed performance of important tasks deliberately can be a risk factor for effective career planning, future functioning as an employee, or on a wider plane, fulfilment of other life roles (Holzer et al., 2022; Karababa, 2022).

Many scholars agree that procrastination is a manifestation of impaired self-regulation in planning one's actions. It is defined as "voluntary delay an intended course of action despite expecting to be worse off for the delay" (Steel, 2007, p. 66). On this definition, procrastination involves intentionality of delay and the subject's awareness of the negative consequences involved. Procrastination, then, is related to the discrepancy between what "is known" and what is actually "done". The tendency to delay the performance of various tasks can at first be associated with selected aspects of functioning and may not entail negative repercussions, but a perpetuated tendency to procrastinate may become habitual and imply many adverse outcomes. Because of this, the presented research strives to examine personality-related conditions of procrastination. The authors resolved to identify selected personality correlates of the tendency to procrastinate occurring in young people during their

early adolescence. Research to date has demonstrated, for example, the importance of fear (generalized and before the assessment), avoidance motivation, and perfectionism (Ljubin-Golub, Petričević, Rovan, 2019; Ocansey, Addo, Onyeaka, Andoh-Arthur, Asante, 2020; Zandieh, Jafariharandi, 2020).

Up to now, procrastination has not been studied among Polish youth, so a knowledge concerning the role of selected personality determinants of procrastination may will help teachers, caregivers and school psychologists to better understand the motivation behind intentional postponement of things to do and develop adequate preventive measures that will cater for students' real needs.

1. Personality in the Big Five model

Personality is regarded as relatively stable behavioural patterns of behaviour related to health, prosperity, the way of interpreting different events and quality of social relations (Tetzner, Becker, Brandt, 2020). It invests human behavior with stability in time and its predictability. A widely known and appreciated concept of personality is the Five-Factor model of personality (the Big Five model), which includes five personality factors: extraversion, conscientiousness, neuroticism, openness to experience, and agreeableness (McCrae, Costa, 1997). These traits are responsible for ways of feeling and reacting. They are also significantly correlated to task-oriented efficacy and school achievements. Extraversion is a trait linked to sociability and positive emotionality (Smillie, Kern, Uljarevic, 2019). It is positively correlated to general well-being and social support-seeking in difficult situations (Sun, Kaufman, Smillie, 2018). Individuals with low extraversion tend to withdraw and back off when socially exposed and in situations that carry a heavy psychological burden. Extraversion may also promote distraction (Tetzner, Becker, Brandt, 2020).

Openness to experiences is associated with cognitive exploration, curiosity and readiness to engage in new activities or discover new ideas (Schwaba, 2019). This trait is also connected with active stress-coping strategies (Malkiewicz, 2014) and overall creativity in problem-solving (Kandler et al., 2016). Openness to experience is positively correlated to school achievement. It is linked to divergent thinking and decision-making autonomy (Tetzner, Becker, Brandt, 2020).

Agreeableness is associated with traits such as compassion, empathy, politeness and modesty (Soto, John, 2017; Tackett et al., 2019). Agreeable persons are tactful and seek harmonious, cooperative relationships. The research carried out by Laursen et al. (2010) and Neyer and Lehnart (2007) showed that this personality trait is linked to positive peer relationships and closer intimacy in this type of contact. Agreeableness implies a higher ability to cooperate with teachers. It promotes a sense of peer membership and belonging to school.

Conscientiousness is linked to a sense of self-control, responsibility for others, diligence and adherence to specific rules (Jackson, Roberts, 2017). This trait is associated with planning and perseverance (Jackson, Hill, 2019). Neuroticism implies emotions such as: fear, irritability, uncertainty, sadness (Shiner, 2019). For persons whose levels of neuroticism are high, failures are particularly hard to bear as they have difficulties to handle stressful situations.Neuroticism is associated with social maladjustment or even specific difficulties in cognitive processing (Shackman et al., 2016) linked to, for example, negative image of self and also one's competences. Neuroticism proves to be negatively correlated with school performance. It can contribute to lower concentration and decreased locus of control.

2. Characteristics of traits underlying Autism Spectrum Disorder

It is argued that an accumulation of the adverse effects of various factors on personality development makes adolescence a period in which various forms of psychopathology are more likely to develop (McLaughlin et al., 2015; Prati, Tomasetto, 2022). For this reason, both researchers and practising psychologists point to manifestations of personality traits in young people that can signal, on the one hand, a disturbed development of their personality, but on the other, predict the need for an early psychological intervention. Traits that may imply such a necessity are, for example, those underly-

ing autism spectrum disorder, referenced in ICD-10, and linked to communication difficulties, complex difficulties in establishing satisfactory relationships, as well as rigid patterns of behaviour (Gerc, Jurek, 2019). Autism spectrum disorder (ASD) is a neurodevelopmental condition defined based on persistent impairment of reciprocal social communication and interaction, and restricted, repetitive behavior patterns, interests, or activities. The current (fifth) edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) and the latest edition of the International Classification of Diseases (ICD-11; WHO, 2018) conceptualize the autism syndrome as a two-domain construct of interaction and social communication deficits (INT-CO), on the one hand, and restricted and repetitive interests/behaviors (RRB) on the other. This marks a substantial change from the long-applied fourth edition of the DSM (DSM-IV) and the tenth edition of the ICD (ICD-10), which classified autism as a triad of observable impairments in social interaction (INT), deficits in communication (CO), and RRB. Notwithstanding the difficulty in conceptualizing traits making up ASD, it is interesting to see that studies of autistic traits in the general population are becoming increasingly prevalent as many individuals who do not meet the diagnostic criteria display traits and behaviours qualitatively similar to the symptoms of the condition (English et al., 2021). Traits and characteristics qualitatively similar to those seen in diagnosed autism spectrum disorder can be found to varying degrees in the general population. Traits such as poor communication, withdrawal, excessive concern for details, or difficulty in attention-switching can manifest themselves quite early or later in life, during adolescence (Courchesne, Gazestani, Lewis, 2020). Poor communication may show up in a person's reluctance to initiate a conversation, be part of it, or maintaining verbal contact with another person. This is manifested in sparse communication, lack of interest in the interlocutor, and aversion to use feedback information. Poor communication implies withdrawal – in other words, a preference for solitary activities, avoidance of group involvement and tasks done collectively. Excessive attention to details is often associated with irrational focus on a chosen aspect of a situation or a task to solve. It can be linked to sensory hypersensitivity (Constant, Bervoets, Hens, Van de Cruys, 2020). What parents first notice and are alarmed by is language and communication problems.

Difficulty in attention-switching is related to a lowered ability to change one's mental attitude when solving a problem or flexibility in responding to a situation when, for instance, thecircumstancessuddenly change (Gerc, Jurek, 2019). Such characteristics may favor procrastination, limiting opportunities of planning, work organisation, and effective fulfilment of school duties (Lei, Russel, 2021). Poor communication and withdrawal may lead to difficulties in making decisions, using feedback from others, reluctance to do group tasks; these, in turn, may provoke ostracism (Dijkhuis, de Sonneville, Ziermans, Staal, Swaab, 2020). Impaired attention-switching may restrict one's learning capabilities, acquisition of new adaptation skills, and flexibility of action (Bertollo et al., 2020).

Some ASD disorders occur more frequently in boys (Demily et al., 2017; Tartaglia et al., 2017). It has recently been demonstrated that the boys/girls ASD ratio is 3:1 (Loomes, Hull, Mandy, 2017). Research also proves that girls meeting the ASD criteria are at a greater risk of not being diagnosed clinically. One reason for that is the phenotype of autism, which is partly responsible for wrong or late diagnosis, or even omitted diagnosis.Typically, girls do not manifest the specific signs of autism. Additionally, their difficulties are noticed only if they show increased cognitive and behavioral problems (Dworzynski et al., 2012). Moreover, diagnosing is made more difficult if problems related to social functioning are concealed by means of a process known as "camouflage" (higher social motivation and higher ability to make friends) (Hodges, Fealko, Soares, 2020; Sedgewick et al., 2015; Volkmar et al., 2014).

3. Procrastination

Procrastination is connected with deliberate delaying the performance of a planned activity despite anticipated negative consequences and a potentially worse outcome (Ferrari, 2010). This characteris-

tic is related to propensity for putting things off until the last moment (Hooshyar, Pedaste, Yang, 2020), and it can be regarded as a self-regulation deficit (Grund, Fries, 2018). The core of procrastination lies in stress avoidance and maintaining one's well-being. In a short term, procrastination can boost a person's well-being, but persistent procrastination may lead to depression, anxiety, reduced well-being, and lower school achievement (Scheunemann, Schnettler, Bobe, Fries, Grunschel, 2022; Zacks, Hen, 2018). It is argued that procrastination evolves under the long-term operation of different factors, including the emotional atmosphere in the family and parenting styles, especially authoritarian parenting (Chen, Yang, Jiao, 2022). Authoritarian parents are overly concerned about their children's failures and show a low tolerance of mistakes done by them. Such a parenting style may induce perfectionism in their children and evoke their excessive sensitivity to being judged by others, and the latter is crucial for the formation of positive self-esteem in children (Chen et al., 2022). Doubts about the validity of the actions taken and fears that a mistake can be made may generate difficulties in organizing everyday activities and carrying them through (Burnam, Komarraju, Hamel, Nadler, 2014). Therefore, children may respond with procrastination to unreasonable demands and impossibility to meet external and internal standards. Research in procrastination in young people has also indicated the important role of the characteristics of the task to be done (e.g., tasks perceived as uninteresting or thought to have little value are usually postponed; Cormack, Eagle, Davies, 2020; Steel, 2007). Researchers also point out such demographics as age or gender (Martin-Puga, Pelegrina, Gómez-Pérez, Justicia-Galiano, 2022; Zhou, 2020), cultural factors or individual personality differences (Steel, Klingsieck, 2016).

Scholars distinguishes several types of procrastination, for example, decisional, behavioral or maladaptive. Decisional procrastination is related to chronic delay of making decisions and choices when they are necessary (Ferrari, Roster, 2018; Hen, Goroshit, 2020). Procrastination of this kind is caused, among other things, by one attempting to save their self-esteem from appearing incompetent to oneself or others, or by fear of making wrong choices and decisions (Ferrari et al., 2007; Ferrari, Roster, 2018). Decisional procrastination is strongly correlated with worrying, regrets and anxiety (Fernie et al., 2016). Individuals characterised by this type of procrastination find it difficult to make crucial life choices, they suffer from negative health consequences and lower satisfaction with life (Patalano, LeClair, 2011). Behavioral procrastination is linked to routine, everyday behaviours, and can involve neglecting one's chores (Tibbett, Ferrari, 2015). It can be manifested in two ways: either as engaging in different (alternative) actions, which delays the original action plan considerably (Tice, Bratslavsky, Baumeister, 2001), or as putting off plans, taking as long as possible to do things – then it often turns out that it is impossible to execute a given plan (Worthley et al., 2006). This sort of deferment contributes to lower self-control (Gharaee, Tamannaeifar, Bakhshizade, Sheybani, 2016). Decisional procrastination was found to be more strongly linked to neuroticism, whereas behavioral procrastination – to conscientiousness (Morris, Fritz, 2015).

Maladaptive procrastination reflects a perpetuated tendency to tarry despite clear indications that this course of action is adverse. This kind of procrastination in young people has been linked the following characteristics: propensity to consume alcohol (Phillips, Ogeil, 2011), impulsiveness (Steel, 2007), or neglecting duties (Westgate, Wormington, Oleson, Lindgren, 2017). Being aware of self-inactivity and negative consequences of procrastination is related to a tendency towards negative self-appraisal (Flett, Stainton, Hewitt, Sherry, Lay, 2012) and self-deprecation (McCown, Blake, Keiser, 2012).

Determinants of procrastination include specific personality traits (e.g., low self-esteem, perfectionism, anxiety) and the discrepancy between intention (the level of readiness to engage in a specific activity) and the actual level of engagement in a particular activity (Klein et al., 2019). Chronic procrastination contributes to lower school performance and persistent difficulties in interpersonal relations (Hen, Goroshit, 2018; Steel, Klingsieck, 2016).

4. Personality Traits in the Big Five model and traits underlying Autism Spectrum Disorder versus Procrastination

Personality traits are among the most important, biologically conditioned factors that can predispose for a tendency to procrastinate (Ocanseyi et al., 2020; Steel, 2007). Researchers have repeatedly demonstrated correlations between the Big Five personality traits along with those of ASD and procrastination although their studies typically focused on young adults or adults in middle age, for example, college students or working people (Alzangana, 2017; Ljubin-Golub et al., 2019; Zandieh, Jafariharandi, 2020). One trait that has frequently been linked to procrastination is conscientiousness, the correlation being negative (Lee, Kelly, Edwards, 2006; Steel, 2007; Watson, 2001; Zandieh, Jafariharandi, 2020). The analysis conducted by Ocansey et al. (2020) showed that procrastination was negatively associated with openness to experience, conscientiousness, extraversion and agreeableness, but positively with neuroticism. A study involving 271 Dutch persons in their emerging adulthood showed that procrastination was linked to the lack of conscientiousness and extraversion, as well as some aspects of neuroticism (Schouwenburg, Lay, 1995). Less conscientious, more introvert and neurotic individuals were likely to demonstrate more procrastinating behaviors. A model study covering 251 Chinese college students demonstrated that persons who were less agreeable and more open to experience were more prone to procrastination (Zhou, 2020). Much less numerousare studies that examine the relationship between traits that may be linked with ASD and procrastination-related behaviors (Carls-Diamante, Laciny; accessed online August 17, 2022). In research to date it has been highlighted that a tendency to focus on minor details, which is often characteristic of people with ASD can hinder general interpretation and comprehension of the problem situation they face. Difficulties in processing different, often more general, contexts of a task are described by the weak central coherence theory (WCC), which addresses autistic individuals (Russell et al., 2019; Scher, Shyman, 2019). Secondarily, this can create a sense of overload and fatigue, and it some cases promote non-activity, withdrawal from task execution, failure to finish an activity or complete it on time (Sun et al., 2019).

Another characteristic typical for autism spectrum disorder that is linked to procrastination, is difficulty shifting attention from one aspect of the task to another or difficulty switching between various tasks performed simultaneously (Dawson, 2018; Murray, 2018). These problems are related to deficits in responding to specific situations flexibly and adequately. Studies indicated, for example, the role of excessive concentration on sensory cues while ignoring social cues, such as verbal instructions and hints (Pellcano, Burr, 2012). Oversensitivity to sensory stimuli can lead to procrastination because it reveals problems with effective selection of relevant versus non relevant features, which will also decrease task performance efficiency (Constant, Bervoets, Hens, Van de Cruys, 2020; Pellcano, Burr, 2012).

5. Method

Procrastination is a problematic behavior that impairs individuals' well-being and school achievements (Gao, Zhang, Xu, Zhou, Feng, 2021). Continual postponement of various life-important activities is a burning issue both individually and socially (Ferrari, 1994; Ferrari & Dovidio, 2000). The well-established habit of putting everything off makes it hard to attain important educational goals and lowers school satisfaction in youth, leading to consequences related to improper duty performance and the accompanying sense of guilt and a decreased sense of self-efficacy. Moreover, it must be noted that there is no research on the personality conditioning of procrastination (with particular regard to autistic characteristics) in Polish adolescents. With this in mind, it was assumed that this study will fill this gap and extend the existing body of knowledge in this regard. The goal was to determine relationships between selected personality traits and the tendency to engage in procrastinating behaviors in a group of young adolescents attending seventh and eight grades of public primary schools in a major city of eastern Poland.

Our review of existing literature allowed us to postulate the following research questions.

1. Which Big Five personality traits related to ASD predict procrastination in four dimensions (general, decisional, behavioral, and maladaptive) in early adolescent boys and girls?
2. What ASD traits predict predictors in four dimensions (general, decisional, behavioral, and maladaptive) in early adolescent boys and girls?

Based on the research problems the following research hypotheses were put forward:

H1: Conscientiousness and neuroticism are significant predictors of procrastinating behaviors in boys and girls. Nevertheless, due to the fact that in light of some research young adolescent girls show a higher level of neuroticism and conscientiousness compared to boys (De Boll et al., 2015) it can be expected that both variables will predict procrastinating behaviors more strongly among girls.

H2: Both groups (boys and girls) are expected to manifest distinct patterns of relationships between neuroticism and conscientiousness and procrastination.

H3: Some ASD traits, such as deficits in communication, social skills and attention-switching, can contribute to increased procrastination both in boys and girls (Russell et al., 2019; Scher, Shyman, 2019).

5.1. Procedure and Participants

The research was conducted in one of the largest cities of eastern Poland in three randomly selected public primary schools. Surveys were carried out during a single meeting with each class in the school year 2018/2019, from February to June 2019. A total of 600 students took part, but the examination of the returned questionnaires qualified 530 survey forms for further processing. The students were aged from 13 to 15 years (M = 13.8, SD = 0.48; 302 girls and 228 boys). All subjects were Polish. The research project was accepted by the Ethical Commission for Scientific Research at the Institute of Psychology of the John Paul II Catholic University of Lublin. The authors informed the subjects that the study had a scientific purpose, participation in the survey was voluntary, and that their responses were anonymous. The survey wascarried out with the consent of the school principals and the children's parents. The questionnaire-based survey was conducted using the pen-and-paper method.

5.2. Research Tools

The Ten-Item Personality Inventory (TIPI) was used, which is a 10-item questionnaire for measuring personality traits covered by the Big Five model encompassing extraversion, agreeableness, conscientiousness, emotional stability and openness to experience. The subject responds to two-adjective statement on a 1–5 scale (from 1 = *I definitely disagree* to 7 = *I definitely agree*) (Łaguna, Bąk, Purc, Mielniczuk, Oleś, 2014, p. 421–437). The score for each scale is a mean of two items. The reliability of the scale ranges from $\alpha = 0.22$ (agreeableness) to $\alpha = 0.65$ (emotional stability).

For the assessment of procrastination the research uses the Pure Procrastination Scale (PPS; by Steel, 2010); Polish adaptation by Stępień and Cieciuch (2013), amended by Stępień and Topolewska (2014). The PPS contains 12 items. The maximum score is 60 points. The higher the score obtained by the participants, the higher their inclination to procrastination. The reliability of the tool was assessed by means of Cronbach's α, which for general procrastination amounted to 0.89 (Stępień, Topolewska, 2014, p. 145–160). The test consists of three subscales: decisional, behavioral and maladaptive procrastination. The survey contains statements for the subject to answer on a scale from 1 (*It is completely not true of me*) to 5 (*It is completely true of me*).

ASD traits were measured with the Autism-Spectrum Quotient (AQ) Adolescent Version (Baron-Cohen, Hoekstra, Knickmeyer, Wheelwright, 2006), adapted for Polish by Pisula et al. (2010). The diagnostic questionnaire was designed to measure the expression of ASD characteristics in a particular person based on self-evaluation. It is important to note that the questionnaire is useful for screening purposes, that is, to measure characteristics that are typical of

autism in the general population. The questionnaire can be used for screening individuals likely to manifest behaviors associated with autism spectrum disorder, because the higher the result, the greater the propensity to behave in ways characteristic of ASD (English et al., 2021). It contains 50 questions assigned to five subscales: communication, social skills, imagination, attention to detail, attention-switching. Each subscale contains 10 items. The AQ is a questionnaire containing subscales for social and non-social aspects of behavior and cognition. The subjects give their answers on a 4-point Likert scale: 1 = *I definitely agree*, 2 = *I agree*, 3 = *I disagree*, 4 = *I completely disagree*. The general score is from 0 to 50. Scores available for individual subscales range from 0 to 10. Cronbach's α reliability coefficient for the AQ as a whole was 0.79. For individual subscales, the reliability coefficients were also high: (communication = 0.82; social skills = 0.88; imagination = 0.81; attention to detail = 0.66; attention-switching = 0.76).

The Polish version was adopted by Pisula, Rynkiewicz, Łucka (2010). It has the same scoring system as the original. A person answers 50 questions, divided into five subscales, with responses on a four-point Likert scale (1 'strongly agree', 2 'rather agree', 3 'rather disagree', 4 'strongly disagree') (Pisula et al., 2013).

6. Results

Interpretation of the results was based on the raw results obtained through the use of the three research tools. Statistical calculations were performed using the IBM SPSS Statistics 24.0 software. The significance level (p) was assumed at .05. First, we tested for normality of distribution using the Kolmogorov–Smirnov test. The variable distribution did not deviate significantly from the standard normal distribution ($p > 0.05$). In order to verify our research hypothesis, we conducted a linear regression analysis. In this analysis, personality traits were predictors (explanatory variables) whereas procrastination was the response variable.

For the purpose of determining whether the personality traits (extraversion, conscientiousness, neuroticism, openness to experience, and agreeableness) and ASD characteristics (communication difficulties, problems with establishing proper social relationships, pattern maintenance, and rigid patterns of behavior) were significant predictors of general, decisional, behavioral, and maladaptive procrastination, a regression analysis was conducted, considering a mixed-effects model. This model extends the classic regression models (West, Kathleen, Gałecki, 2014). Additionally, the model factors in the gender, age, as well as interactions between the gender and personality dimensions (owing to significant differences between the genders).

The analyzed model was well fitted to the data ($F[17, 604] = 10.83$; $p < 0.001$) and explained 21.2% of the variance in general procrastination (adj. $R2 = 0.212$). The analysis showed that general procrastination was significantly predicted by gender, agreeableness, conscientiousness, and emotional stability. Also the interaction between gender and agreeableness was significant. The correlation between agreeableness and general procrastination in girls was insignificant ($B = 0.26$; $SE = 0.30$; $p = 0.386$), while for boys it was negative ($B = –1.09$; $SE = 0.32$; $p = 0.001$) – the higher the agreeableness level, the lower the level of procrastination in boys.

Next, similar calculations were performed for procrastination and its decisional aspect (Table 2).

The model was well fitted to the data ($F[17, 604] = 6.74$; $p < 0.001$) and it explained 13.6% of the variance in decisional procrastination (adj. $R2 = 0.136$). The analysis showed that decisional procrastination was significantly predicted by agreeableness, conscientiousness, and emotional stability. The higher the level of agreeableness, conscientiousness, and stability, the lower the level of decisional procrastination. Of significance was also the interaction between gender and agreeableness. The correlation between agreeableness and decisional procrastination in girls was insignificant ($B = 0.05$; $SE = 0.10$; $p = 0.601$), while for boys it was negative ($B = –0.33$, $SE = 0.10$, $p = 0.001$) – the higher the agreeableness level, the lower the level of procrastination in boys. The last but one step was to test whether personality traits inthe Big Five and ASD predict procrastination in the behavioral dimension. Like previously, the model

Table 1. Mixed-effects Coefficients for Model Explaining General Procrastination

Parameter	*B*	*SE*	*95% CI*		*P*
			LL	*UL*	
Gender	–8.87	3.50	–15.74	–2.01	0.011
Age	0.03	0.24	–0.44	0.49	0.913
Autism spectrum disorder related traits	–0.04	0.04	–0.12	0.05	0.415
Extraversion	–0.30	0.30	–0.90	0.30	0.325
Agreeableness	–1.01	0.33	–1.66	–0.37	0.002
Conscientiousness	–2.09	0.33	–2.74	–1.44	<0.001
Stability	–0.75	0.31	–1.35	–0.14	0.015
Openness	0.29	0.37	–0.45	1.02	0.443
Gender* Extraversion	0.57	0.42	–0.26	1.40	0.180
Gender* Agreeableness	1.23	0.46	0.32	2.13	0.008
Gender* Conscientiousness	–0.25	0.45	–1.14	0.64	0.577
Gender* Emotional Stability	–0.14	0.42	–0.95	0.68	0.743
Gender* Openness to Experience	0.33	0.54	–0.74	1.39	0.550

Table 2. Mixed-Effects Coefficients for the Model Explaining Decisional Procrastination

Parameter	*B*	*SE*	*95% CI*		*P*
			LL	*UL*	
Gender	–8.87	3.50	–15.74	–2.01	0.011
Age	0.03	0.24	–0.44	0.49	0.913
Autism spectrum disorder related traits	–0.04	0.04	–0.12	0.05	0.415
Extraversion	–0.30	0.30	–0.90	0.30	0.325
Agreeableness	–1.01	0.3	–1.66	–0.37	0.002
Conscientiousness	–2.09	0.33	–2.74	–1.44	<0.001
Stability	–0.75	0.31	–1.35	–0.14	0.015
Openness	0.29	0.37	–0.45	1.02	0.443
Gender* Extraversion	0.57	0.42	–0.26	1.40	0.180
Gender* Agreeableness	1.23	0.46	0.32	2.13	0.008
Gender* Conscientiousness	–0.25	0.45	–1.14	0.64	0.577
Gender* Emotional Stability	–0.14	0.42	–0.95	0.68	0.743
Gender* Openness to Experience	0.33	0.54	–0.74	1.39	0.550

included gender, age, as well as interactions between the gender and personality dimensions, owing to significant differences between the genders. The results are presented in Table 3.

The analyzed model was well fitted to the data ($F[17, 604] = 7.98$; $p < 0.001$) and explained 16% of the variance in general procrastination (adj. $R2 = 0.160$). The analysis demonstrated that gender was a significant predictor of behavioral procrastination, as well as two personality traits: agreeableness and conscientiousness. The higher the level of agreeableness and conscientiousness, the lower the level of behavioral procrastination. Finally, similar calculations were performed for procrastination in the maladaptive dimension. Now the model included gender and age as well as interaction between gender and personality dimensions (to account for significant differences between the genders).

Table 3. Mixed-Effects Coefficients for the Model Explaining Behavioral Procrastination

Parameter	*B*	*SE*	*95% CI*		*p*
			LL	*UL*	
Gender	−4.55	2.27	−9.00	−0.10	0.045
Age	−0.01	0.15	−0.31	0.30	0.964
Autism spectrum disorder related traits	−0.03	0.03	−0.08	0.03	0.357
Extraversion	−0.27	0.20	−0.66	0.11	0.166
Agreeableness	−0.42	0.21	−0.84	0.00	0.049
Conscientiousness	−1.14	0.22	−1.56	−0.71	<0.001
Stability	−0.38	0.20	−0.77	0.02	0.059
Openness	0.09	0.24	−0.38	0.57	0.704
Gender* Extraversion	0.53	0.27	−0.01	1.06	0.056
Gender* Agreeableness	0.46	0.30	−0.13	1.04	0.127
Gender* Conscientiousness	−0.15	0.29	−0.73	0.42	0.600
Gender* Emotional Stability	−0.06	0.27	−0.59	0.47	0.819
Gender* Openness to Experience	0.28	0.35	−0.41	0.97	0.426

Table 4. Mixed-Effects Coefficients for the Model Explaining Maladaptive Procrastination

Parameter	*B*	*SE*	*95% CI*		*p*
			LL	*UL*	
Gender	−2.58	1.22	−4.98	−0.18	0.035
Age	−0.05	0.08	−0.21	0.11	0.549
Autism spectrum disorder related traits	−0.01	0.02	−0.04	0.02	0.490
Extraversion	0.05	0.11	−0.16	0.26	0.658
Agreeableness	−0.26	0.12	−0.48	−0.03	0.026
Conscientiousness	−0.49	0.12	−0.71	−0.26	<0.001
Stability	−0.16	0.11	−0.37	0.05	0.133
Openness	0.10	0.13	−0.15	0.36	0.435
Gender* Extraversion	−0.05	0.15	−0.35	0.24	0.714
Gender* Agreeableness	0.37	0.16	0.05	0.68	0.023
Gender* Conscientiousness	−0.06	0.16	−0.37	0.26	0.727
Gender* Emotional Stability	0.06	0.15	−0.23	0.34	0.704
Gender* Openness to Experience	0.10	0.19	−0.27	0.48	0.583

The analyzed model turned out to be well fitted to the data ($F[17, 604] = 5.07$; $p < .001$), and it explained 10.0% of the variance in non-adaptive procrastination (adj. $R2 = 0.100$). The analysis demonstrated that gender was a significant predictor of maladaptive procrastination, as well as two personality traits: agreeableness and conscientiousness. An increase in the level of agreeableness and conscientiousness correlated with a decrese in maladaptive procrastination. The interaction between gender and agreeableness was sginificant. The correlation between agreeableness and maladaptive procrastination in girls was insignificant ($B = 0.11$; $SE = 0.10$; $p = 0.303$), while for boys it was negative ($B = -0.25$, $SE = 0.11$, $p = 0.023$) – the higher the agreeableness level, the lower the level of maladaptive procrastination, just like with the other dimensions of procrastination.

7. Discussion and Conclusions

The purpose of the research was to verify whether the personality traits from the Big Five model and related to autism spectrum disorder are predictors of procrastination in students in early adolescence. Also, it was assumed that those correlations might be different between the genders as research shows that boys and girls on the threshold of adolescence differ in terms of personality and propensity to procrastinate (Branje, Lieshout, Gerris, 2007; Steel, 2007; Steel, Ferrari, 2013). It was also expected that answering this question would contribute to the existing knowledge about links among the personality factors of procrastination in youth.

General procrastination was significantly predicted by the gender of the respondents, and the following personality traits: agreeableness, conscientiousness, and emotionalstability. The higher the level of agreeableness, conscientiousness, and emotional stability, the lower the level of general procrastination was. Our research indicatethat agreeableness, conscientiousness and neuroticism (low emotional stability) do not favor procrastination and this result confirms previous findings. Lay et at. (1998), in a study involving 280 younger adolescents, showed a negative relationship between conscientiousness and procrastination. Agreeable persons, as evident from the research done by Horwood and Anglim (2018) manifested less tendency to procrastinate, they spended more time struggling with problems they faced, and they displayed a higher level of self-control. Watson (2001) notes that young people who are highly stable emotionally, can stand a better chance of succeeding at school, which somehow prevents them from procrastination.

When the gender model was included, it appeared that the relationship between agreeableness and general procrastination in boys was negative and significant. The higher the level of agreeableness, the lower the level of general procrastination in boys was. This result can be explained by the fact that agreeableness is a trait associated with readiness to cooperate and a prosocial attitude towards people (Costa, McCrae, 1992). Agreeableness does not favor rivalry, because the competitive attitude can be associated with exaggerated expectations of the actions undertaken, comparison of one's competences and achievements with those of others. Such a confrontational attitude can promote procrastination by delaying the performance of activities which may decrease one's positive self-image. Procrastination might be, in such circumstances, a way to avoid fear of failure of being judged by others (Steel, 2007). In relation to our subjects it can be stated that agreeableness in boys and their associated readiness to form satisfying and harmonious relations with people is a factor that protects them from a tendency to procrastinate. This could mean that having satisfactory relationships with others, based on cooperation, may decrease procrastination.

It is worth noting that the majority of research suggests that procrastination affects mainly boys and men (Steel, 2007; Ferrari, Doroszko, Joseph, 2005; Steel, Ferrari, 2013).The result obtained in the present study is in line with the results obtained by Martín-Puga et al., (2020) indicating a higher propensity to procrastinate in a group of boys than in girls, both aged between 7 and 19 years.

Our analyses of decisional procrastination showed that it was significantly predicted by gender, too, and by the following personality traits: agreeableness, conscientiousness, and emotional stability. The higher the level of agreeableness, conscientiousness, and emotional stability, the lower the level of decisional procrastination. Therefore, a high level of these traits is a factor that protects one against decisional procrastination. The research of Milgram and Tenne (2000) demonstrated a link between decisional procrastination and personality traits (neuroticism, low conscientiousness). The correlation between agreeableness and decisional procrastination was significant only in men: higher agreeableness was linked to lower decisional procrastination. In this regard, then, the distribution of results proved very similar to that of general procrastination. Decisional procrastination, as research shows, is associated with chronic postponement of making decisions (Hen, Goroshit, 2020); also, it is strongly linked to the conservation of self-esteem against showing one's incompetence (Ferrari et al., 2007). Persons manifesting this type of procrastination have difficulty making choices

(Patalano, LeClair, 2011). Research by Sandhya and Gipinath (2019) demonstrated a correlation between agreeableness and making irrational decisions in active procrastination. People who display a high level of decisional procrastination experience conflicts related to choosing relevant information and ways to achieve a task. In order to avoid conflicts they try to focus on less stressful activities.

As regards behavioral procrastination, it was significantly predicted by gender, agreeableness, and conscientiousness. This type of procrastination is associated with a delayed performance of task in everyday functioning (Tice et al., 2001). Just as in our research, Danei and Hashemi (2018) showed a negative correlation between behavioral delay and conscientiousness. Similarly as in the case of general, decisional, and maladaptive procrastination, the significant predictors of behavioral delay were personality traits (agreeableness and conscientiousness).

In the successive stages of our research, we decided to analyse which factor predicted maladaptive procrastination. The analysis demonstrated that it was significantly predicted by gender and two personality traits: agreeableness and conscientiousness. An increase in the level of agreeableness and conscientiousness correlated with a decrease in maladaptive procrastination. The correlation between agreeableness and maladaptive procrastination was significant only in boys. A higher level of agreeableness implied in them a lower level of maladaptive procrastination, similarly as in the case of the other dimensions of procrastination. Maladaptive procrastination is associated with the preservation of self-esteem (Flett et al., 2012), achieved by the postponement of planned activities. Similarly as in the case of the other types of procrastination, the significant predictors of maladaptive procrastination were conscientiousness and agreeableness.

Summing up the results, it must be concluded that this research has largely corroborated earlier findings related to the role of individual personality characteristics accounted for by the Big Five model in explaining procrastination (Burnam et al., 2014; Hen, Goroshit, 2020; Steel, Klingsieck, 2016; Zhou, 2020). It is interesting though, that none of the ASD traits was linked in any way to aspects of procrastination. Problems with communication, social relationships, some amount of patterned conduct, and rigid patterns of functioning were not helpful in explaining young people's tendency to procrastinate (Gerc, Jurek, 2019). Also, this research has demonstrated the role of gender as a significant factor explaining procrastination. It has been frequently shown that boys are more likely to procrastinate than girls (Ferrai, Tice, 2000; Steel, 2007). It is noteworthy that in this research this tendency was captured in boys in their early adolescence, which might imply that gender differences in procrastination occur relatively early. This is why our results can help to develop practical guidelines for working with youth. It should take into account personality underpinnings, because personality determines the choice of behaviors, coping with frustration and failure, and affects goal formation and ways to achieve them. An accurate identification of strengths and weaknesses of adolescent functioning will make it possible to develop methods that address the real needs of school students. Educational work, in particular, should aim at reinforcing such characteristics as conscientiousness, patience and the ability to postpone gratification. School students should know who to turn to for help if they experience difficulties, so that they deal with their problems actively. Passivity, in turn, may promote procrastinating behaviors, since it is a means of escaping from directly confronting a difficulty. The parents, too, should have access to relevant information. Optimally, they should be made aware of the issue of adverse effect of unreasonable school demands, which evoke in their children a sense of perfectionism and fear of failure.

Our research has several limitations. Procrastination is probably a phenomenon subject to multiple factors acting in a long-term perspective. Therefore, it is seems expedient for future studies to focus on not only personality traits as significant predictors of procrastination but also other aspects of young people's functioning (emotions and motivational processes). As the research by Iłendo-Milewska and Wojtach (2014) confirmed, boys in early adolescence tended to have a lowered sense of autonomy and responsibility. This can lead to a diminished quality of learning and involvement in school activities (Connel, Wellborn,

1991; Reeve, Bolt, Cai, 1999). For this reason, future studies should take into account analysis of such traits as locus of control and responsibility. Apart from this, we did not include self-efficacy in our study of young people. A growing number of authors notice links between self-efficacy and procrastination (Steel, 2007). Another limitation of the presented study was the fact that we did not control for such significant variables as the socioeconomic status of the subjects' families. Taking these variables into consideration could have provided a more detailed description of the correlation between personality characteristics and procrastination in the group of early adolescents.

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