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MEDIATING ROLE OF A FIELD OF STUDY IN THE RELATIONSHIP BETWEEN THE BROAD AUTISM PHENOTYPE AND THE SENSE OF COHERENCE

Krystyna Teresa Panas^[A,B,C,D,E,F], Zbigniew B. Gaś^[A,B,C,D,E,F]

University of Economics and Innovation, Lublin, Poland

SUMMARY

Background:

Recent studies reveal a growing number of individuals with the traits of broad autism phenotype who display communication problems and difficulties in establishing interpersonal relations. Studies suggest that BAP traits are more frequent in students of the sciences than in humanities students. Therefore, the present study aimed to establish the mediating role of a field of study in the relationship between BAP and the sense of coherence.

Material/ Methods:

The study included 168 students (90 females and 78 males) of science and humanities. We administered the AQ questionnaires (Autism -Spectrum Quotient, Baron-Cohen et al., 2001) for adults, the Sense of Coherence Questionnaire (SOC - 29, Antonovsky, 1987, 1993).

Results:

The study confirmed that BAP traits are more expressed in students of science than in students of arts as well as in men than women. Also, relationships between the intensity of BAP traits and comprehensibility, manageability, and meaningfulness were noted, but not between the total sense of coherence. Therefore, we concentrated on evaluating a mediating effect of the field of study and these three dimensions.

Conclusions:

The positive relationships between BAP meaningfulness and manageability suggest that the appropriate choice of the field of study plays a significant role in finding meaning in life and developing an ability to cope with emerging difficulties. Since the field of study is closely linked to the type of work, it might be assumed that the same role is played by a job that makes sense. It explains the frustration of brain-damaged patients at being unable to work. Clinical data show that giving such patients an opportunity to be active in any field restores their sense of meaning in life.

Keywords: broad autism phenotype, a field of study, gender, sense of coherence, comprehensibility, manageability, meaningfulness

INTRODUCTION

The broad autism phenotype (BAP) describes the symptoms of behavior, which are qualitatively similar to those typical of the broad autism spectrum, but usually milder and outside of diagnostic criteria (Piven, 2002; Wheelwright, Auyeung, Allison, & Baron-Cohen, 2010). They are observed primarily in lineal blood relatives of persons with ASD (Sung et al., 2005). However, the researchers report these traits more and more often in the general population (Robinson et al., 2011). People who display the broad autism phenotype have difficulties with establishing close interpersonal relationships, such as friendship or love (Sasson, Nowlin, & Pinkham, 2013), have aloof personalities (Austin, 2005), are less able to recognize emotions (Szatmari et al., 2008) and emotional messages based on the tone of voice (Yap, McLachlan, Scheffer, & Wilson, 2018), have deficits in language pragmatics (Meera et al., 2015), and also have deficits in executive (Cruz, Camargos-Junior, & Rocha, 2012) and cognitive functions (Losh & Piven, 2007). These deficits may contribute to difficulties in understanding the surrounding world and generate social deficits, triggering the tendency for isolating from others and consequently intensifying the BAP traits. However, when adopting the perspective of behavioral genetics, we may assume that fine selection of external stimuli may decrease the intensity of BAP traits. Studies indicate that people with the broad autism phenotype feel comfortable at performing work in the field of technology, engineering, or mathematics, which require skills, such as systemizing data, running complex analysis, and developing systems based on hard principles (cf. Baron-Cohen et al., 1997, 2001; Billington, Baron-Cohen, & Wheelwright, 2007; Roelfsema et al., 2012; Ruzich et al., 2015). The other authors (e.g., Morsanyi, Primi, Handley, Chiesi, & Galli, 2012) claim no such correlation. In their opinion, the increased interest and skills in mathematics and engineering are not so much “the effect of autistic personality” and specific cognitive profile but reflect the attitude towards these fields of science. Also, they point out that anxiety affects the ability to solve mathematics problems, resulting in both in male-female discrepancy in the students of science and a choice of major (see also Ashcraft, Mark, & Faust, Michael. (1994). An ability to manage stress seems to play a significant role in this case. Bearing this in mind, we decided to assess the relationships between the broad autism phenotype (BAP) and the sense of coherence in students of science and social studies. The subjects were not related to people with ASD but exhibited traits qualitatively similar to the typical for broad-spectrum autism.

MATERIAL AND METHODS

The objective of this study was to establish the mediation role of a scientific discipline in relationships between the broad autism phenotype and sense of coherence. Both total general dimension and its facets: manageability, comprehensibility, and meaningfulness were taken into consideration.

Participants

The participants were 168 students (90 females and 78 males) of humanities (such as psychology and pedagogy – 47.0%), and sciences (mathematics and computer science - 53.0%). The age of the participants ranged between 19 and 27 ($M = 22.20$, $MD = 22.00$, $SD = 1.36$). The differences in the number of individuals representing the compared groups due to the gender criterion ($\chi^2 = 0.857$, $p = 0.355$) and discipline ($\chi^2 = 0.595$, $p = 0.440$) are not statistically significant.

Measures and Procedures

The respondents were informed that their participation in this study is voluntary and anonymous and that they can resign from it at any time. All participants consented to the participation and signed relevant documents. They were administered a set of two standardized tests: AQ (The Autism-Spectrum Quotient) and SOC-29 (Sense of Coherence Questionnaire).

The AQ questionnaire (Test AQ – Autism-Spectrum Quotient, Baron-Cohen et al., 2001, the Polish adaptation by Pisula, Rynkiewicz and Łucka, 2010/2013) is a self-reporting tool that allows a respondent to assess statements using the answering system based on the Likert scale (*Strongly agree, somewhat agree, Somewhat disagree, Strongly disagree*). The overall score is within the range (0-50 points); 1 point is given for each answer indicating the presence of autism spectrum traits. It is also possible to obtain results for five areas: social skills, communication, attention switching, imagination, attention to detail. The score in each of the areas ranged between 0-10 points. AQ is not a diagnostic tool, so even a high overall score (over 32 points) does not indicate ASD disorders. The tool makes it possible to identify the range of autistic traits in people with an average level of intelligence (Baron-Cohen et al., 2001). The internal consistency of the overall score, expressed by Cronbach's alpha coefficient, is 0.71, while the internal consistency in individual scales is less satisfactory. It is 0.71 only for social skills and 0.45 to 0.60 for other areas; therefore, only the overall score of the scale will be used in calculations.

The Sense of Coherence Questionnaire – SOC-29, Antonovsky, (1987, 1993), (the Polish adaptation by Koniarek, Dudek, Makowska, 1993) consists of 29 statements. The participant gives answers applying a seven-point scale: from 1 (*I never have this feeling, it will definitely not be done...*) to 7 (*I always have this feeling, it will definitely be done...*). The minimum possible score is 29 points, and the maximum score is 203 points. SOC-29 is a tool that allows for calculating the overall score for the sense of coherence and the scores for three dimensions of this phenomenon: comprehensibility consisting of 11 test items, manageability, comprising ten statements, and meaningfulness, including 8 test items. The Cronbach's alpha coefficient has the following values in individual dimensions: comprehensibility $\alpha = 0.85$; manageability $\alpha = 0.87$; meaningfulness $\alpha = 0.89$.

In addition, to the field of study, gender was taken under consideration.

RESULTS

First, the descriptive statistics were verified before testing the hypotheses, taking into account gender and a field of study (Table 1).

The mean group's score obtained by administering the AQ questionnaire ($M = 10.70$) is significantly below the mean given by Baron-Cohen (Baron-Cohen et al., 2001), which was 17.6 for students, and 16.64 in studies on Polish adaptation (Pisula, Rynkiewicz, & Łucka, 2010/2013). The mean score obtained by men ($M = 11.77$) was higher than the score obtained by women ($M = 9.78$) (mean difference $M_M - M_K = 1.99$, $t(166) = 4.059$, $p < 0.001$) and also higher among those studying exact sciences ($M = 12.06$) in comparison with social sciences ($M = 9.18$) (mean difference $M_{\text{ŚC}} - M_{\text{SP}} = 2.88$, $t(166) = -6.220$, $p < 0.001$).

The mean score obtained in the SOC questionnaire for the whole group $M = 108.79$, was higher for men ($M = 111.20$) than for women ($M = 106.70$) (mean difference $M_M - M_K = -4.50$, $t(166) = -3.751$, $p < 0.001$), and higher for the students of exact sciences ($M = 110.51$) than social sciences ($M = 106.86$) (mean difference $M_{\text{ŚC}} - M_{\text{SP}} = 3.64$, $t(166) = -2.994$, $p = 0.003$). The mean score for the whole group on the comprehensibility scale was $M = 36.31$, the mean score for men ($M = 37.11$) was higher than for women ($M = 35.62$), but the difference was statistically insignificant (mean difference $M_M - M_K = 1.49$, $t(166) = -1.256$, $p = 0.211$). Also, the students of sciences obtained the mean score ($M = 36.67$) slightly higher than students of social sciences ($M = 35.91$), the difference proved to be statistically insignificant ($M_{\text{ŚC}} - M_{\text{SP}} = -0.763$, $t(166) = -0.640$, $p = 0.532$). The mean score for the whole study group on the manageability scale was $M = 42.72$, for men ($M = 43.15$) was higher than for women ($M = 42.34$), but the difference was statistically insignificant ($M_M - M_K = 0.809$, $t(166) = -1.147$, $p = 0.253$). The students of sciences ($M = 43.17$) had higher scores than students of social sciences ($M = 42.21$), but the difference was not statistically significant ($M_{\text{ŚC}} - M_{\text{SP}} = 0.953$, $t(166) = -1.354$, $p = 0.178$). With regard to the last scale - meaningfulness, the mean score for the whole group was $M = 30.52$ and also proved to be higher for men ($M = 31.81$) than for women ($M = 29.4$), and here the difference was statistically significant ($M_M - M_K = 2.408$, $t(166) = -4.586$, $p < 0.001$). Similarly, the mean difference between students of sciences ($M = 31.51$) and humanities ($M = 29.40$) was statistically significant ($M_{\text{ŚC}} - M_{\text{SP}} = 2.100$, $t(166) = -3.945$, $p < 0.001$).

The preliminary verification of assumptions concerning mediating role of the field of study in the relationship between autism phenotype and the sense of coherence was carried out using the r-Pearson correlation analysis (see Table 2). Significant relationships were found between the broad autism phenotype and gender, as well as a preferred field. This confirms the previous observations that men more often than women exhibit traits similar to the autistic spectrum. People with more of these traits more often choose sciences as their area of interest and study. Moreover, the BAP traits correlated negatively, though weakly, with comprehensibility, and positively with manageability and meaningfulness.

Table 1. Descriptive statistics of study variables.

			M	MD	SD	Skewness / standard error	Kurtosis / standard error	Normal distribution	Levene's test
AQ _{BAP}		Total (N = 168)	10.70	10.50	3.31	0.188 / 0.187	-0.378 / 0.373	Z = 0.084, p = 0.006	F(1,166)
	Gender	Women (n = 90)	9.78	10.00	3.01	0.163 / 0.254	-0.111, 0.503	W = 0.984, p = 0.321	2.325, p = 0.77
		Men (n = 78)	11.77	12.00	3.34	0.072 / 0.272	-0.660 / 0.538	W = 0.975, p = 0.137	2.115, p = 0.148
	Field of study	Humanities (n = 79)	9.18	9.00	2.66	-0.053 / 0.271	-0.387 / 0.535	W = 0.981, p = 0.276	
SOC		Sciences (n = 89)	12.06	12.00	3.26	-0.005 / 0.255	-0.624 / 0.506	W = 0.979, p = 0.153	4.06, p = 0.046
	Gender	Total	108.79	108.50	8.06	0.148 / 0.187	-0.368 / 0.373	Z = 0.056, p = 0.200*	
		Women	106.70	106.50	7.73	0.260 / 0.254	-0.223 / 0.503	W = 0.986, p = 0.453	0.001, p = 0.974
		Men	111.20	111.00	7.80	0.042 / 0.272	-0.326 / 0.538	W = 0.985, p = 0.519	
SOC _{COMPR}	Field of study	Humanities	106.86	106.00	7.81	0.322 / 0.271	-0.239 / 0.535	W = 0.980, p = 0.265	0.006, p = 0.938
		Sciences	110.51	110.00	7.93	0.007 / 0.255	-0.230 / 0.535	W = 0.985, p = 0.405	
	Gender	Total	36.31	36.00	7.70	0.116 / 0.187	-0.580 / 0.373	Z = 0.065, p = 0.083	0.317, p = 0.574
		Women	35.62	35.50	7.54	0.236 / 0.254	-0.481 / 0.503	W = 0.980, p = 0.177	
SOC _{MANAG} _E	Field of study	Men	37.11	37.00	7.85	-0.027 / 0.272	-0.570 / 0.538	W = 0.986, p = 0.573	0.332, p = 0.565
		Humanities	35.91	35.00	7.52	0.193 / 0.271	-0.464 / 0.535	W = 0.983, p = 0.360	
	Gender	Sciences	36.67	36.00	7.88	0.046 / 0.255	-0.624 / 0.506	W = 0.986, p = 0.445	0.966, p = 0.327
		Total	42.72	43.00	4.57	-0.050 / -0.187	-0.417 / 0.373	Z = 0.075, p = 0.023	
SOC _{MEAN}	Field of study	Women	42.34	42.00	4.72	0.007 / 0.254	-0.581 / 0.503	W = 0.985, p = 0.382	0.124, p = 0.725
		Men	43.15	44.00	4.37	-0.085 / 0.272	-0.114 / 0.538	W = 0.989, p = 0.717	
	Field of study	Humanities	42.21	42.00	4.38	0.065 / 0.271	-0.588 / 0.535	W = 0.980, p = 0.264	
		Sciences	43.17	44.00	4.70	-0.174 / 0.255	-0.212 / 0.506	W = 0.989, p = 0.654	2.590, p = 0.109
	gender	Total	30.52	30.00	3.59	0.367 / 0.187	-0.056 / 0.373	Z = 0.113, p = 0.001	10.107, p = 0.002
	Field of study	Women	29.4	29.00	3.18	0.236 / 0.254	0.320 / 0.503	W = 0.984, p = 0.333	
		Men	31.81	31.00	3.62	0.335 / 0.272	-0.615 / 0.538	W = 0.967, p = 0.040	
	Field of study	Humanities	29.40	29.00	2.79	0.224 / 0.271	0.134 / 0.535	W = 0.984, p = 0.418	
		Sciences	31.51	31.00	3.93	0.085 / 0.255	-0.397 / 0.506	W = 0.979, p = 0.158	

Notes: AQ_{BAP} –the score of the Autism-Spectrum Quotient Questionnaire; SOC – the score of the Sense of Coherence Questionnaire;
W - Shapiro-Wilk test for N<100; Z –Kolmogorov-Smirnov test for N>100
* lower limit of actual significance

Fig. 1. The mediation model the BAP impact on meaningfulness with the field of study as a mediator

		AQ _{BAP}	SOC	SOC _{COMP}	SOC _{MANAG}	SOC _{MEAN}
gender	<i>r</i>	0.301**	0.280**	0.097	0.089	0.335**
	<i>p</i>	0.000	0.000	0.211	0.253	0.000
Field of study	<i>r</i>	0.435**	0.226**	0.050	0.104	0.293**
	<i>p</i>	0.000	0.003	0.523	0.178	0.000
AQ _{BAP}	<i>r</i>		0.029	-0.233*	0.246**	0.189
	<i>p</i>		0.711	0.002	0.001	0.014

Notes:: AQ_{BAP} –the score of the Autism-Spectrum Quotient Questionnaire; SOC – the score of the Sense of Coherence Questionnaire; SOC_{COMP} – comprehensibility factor, SOC_{MANAG} – manageability factor, SOC_{MEAN} – meaningfulness factor

The adopted model assumes that a high BAP score may affect the sense of coherence both in general dimension, and comprehensibility, manageability, and meaningfulness. At the same time, the choice of the field of study may be a significant mediator of this relationship. The statistical analyses were performed according to the Baron and Kenny (1986) mediation model in three steps.

First, the assumption of the predictive role of the intensity of BAP traits for the sense of coherence in the general dimension and comprehensibility, manageability, and meaningfulness were verified. The results of the correlation analysis presented in Table 2 confirmed the possibility of these relationships, except for the general sense of coherence. Therefore, this variable will not be taken into account in further analyses. Concerning comprehensibility, the model was well suited to the data $F(1,166) = 9.515, p = 0.002$. However, it explained only 5% of the variable variance ($R^2 = 0.054$); the obtained value $\beta = -0.233$ suggests that comprehensibility may weaken along with increasing the intensity of BAP. However, the predictive role of BAP for manageability and meaningfulness is a bit surprising due to the positive value of the β coefficient ($\beta_{MEAG} = 0.246, \beta_{MEAN} = 0.189$). Those results indicate that the increase in the intensity of BAP traits does not decrease manageability and meaningfulness. The good match of the models was confirmed by the coefficient value of $F_{MEAG}(1,166) = 10.656, p = 0.001$; $F_{SENS}(1,166) = 6.154, p = 0.014$. In the case of manageability, the adopted model explains only 6% ($R^2 = 0.060$), and in the case of meaningfulness, less than 4% ($R^2 = 0.036$) of the variances of variables.

The second step was to establish the predictive role of the broad phenotype of autism in relation to the field of study. The analysis of regression showed a good match of the model of $F(1,166) = 38.69, p < 0.001$. The obtained value of $\beta = 0.435$ indicates a moderate correlation between the choice of discipline and the intensity of BAP traits. The value of coefficient $R^2 = 0.189$ indicates that it explains nearly 19% of the variance of variables. Additionally, following the Baron and Kenny model, the predictive role of the study discipline was established concerning the sense of coherence in the dimensions of comprehensibility, manageability, and meaningfulness. The regression analysis showed a good match of the models only for the predictive role of the field of study with respect to the general dimension of the sense of coherence $F(1,166) = 8.963, p = 0.003$,

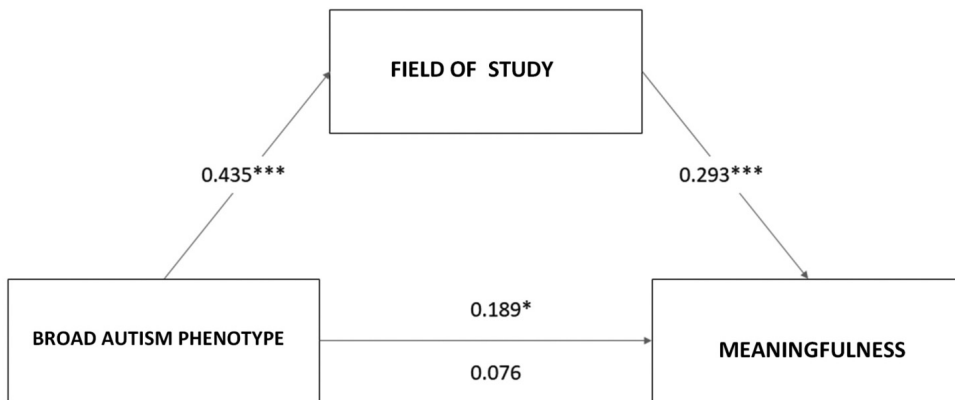


Fig. 1. The mediation model the BAP impact on meaningfulness with the field of study as a mediator

and the dimension of meaningfulness $F(1,166) = 15.566, p < 0.001$. The obtained β values indicate a weak correlation of the sense of coherence in the general dimension ($\beta_{SOC} = 0.226$) and meaningfulness ($\beta_{MEAN} = 0.293$) with the field of study. The values of the R^2 coefficient explain only 5% of the variance of variables in the case of the field of study and the sense of coherence and less than 9% for the field of study and meaningfulness.

Third, we evaluated the mediating role of the field of study in the relation between the broad phenotype of autism and the sense of coherence in the dimensions of comprehensibility, manageability, and meaningfulness. According to Baron and Kenny (1986), the mediation analysis requires prior determination of significant interrelations between the independent and dependent variable and the independent variable and the mediator. As no relationship between the broad phenotype of autism and the sense of coherence was found in the regression analyses presented so far, it will be excluded from mediation analyses.

The multivariate regression analyses (see Table 3), with the simultaneous participation of the independent variable and mediator, confirmed that BAP traits were no significant predictors of meaningfulness. In contrast, the mediator (a field of study) proved to be the significant predictor only of meaningfulness ($\beta = 0.260, p = 0.002$). It suggests a total mediation of the field of study. The graphical model of mediation is shown in Figure 1.

Further verification of the findings was performed with the Aroian test. It makes it possible to assess the significance of the relationship between the independent variable and the mediator by taking into account a correction for the correlation of the components of the indirect effect. The result of the Aroian test confirmed the total mediation of the *field of study* in the relationship between the broad phenotype of autism and meaningfulness ($Z = 2.76, s = 0.04, p = 0.006$) and the lack of mediation effect in the relation between the broad phenotype of autism and manageability ($Z = -0.033, s = 0.05, p = 0.97$). In the case of comprehen-

Fig. 1. The mediation model the BAP impact on meaningfulness with the field of study as a mediator

	<i>B</i>	Standard error <i>s</i>	<i>R</i> ²	β	<i>F</i> (1,166)	<i>t</i>	<i>p</i>
Sense of coherence							
AQ _{BAP}	-0.209	0.204	0.057	0.086	5.005	-1.022	0.308
Field of study	4.246	1.352		0.264		3.141	0.002
Comprehensibility							
AQ _{BAP}	-0.728	0.192	0.082	-0.314	7.395	-3.788	0.001
Field of study	2.860	1.273		0.186		2.246	0.026
Manageability							
AQ _{BAP}	0.340	0.115	0.060	0.247	5.297	2.946	0.004
Field of study	-0.026	0.765		-0.003		-0.034	0.973
Meaningfulness							
AQ _{BAP}	0.083	0.089	0.090	0.076	8.203	0.924	0.357
Field of study	1.863	0.591		0.260		3.150	0.002

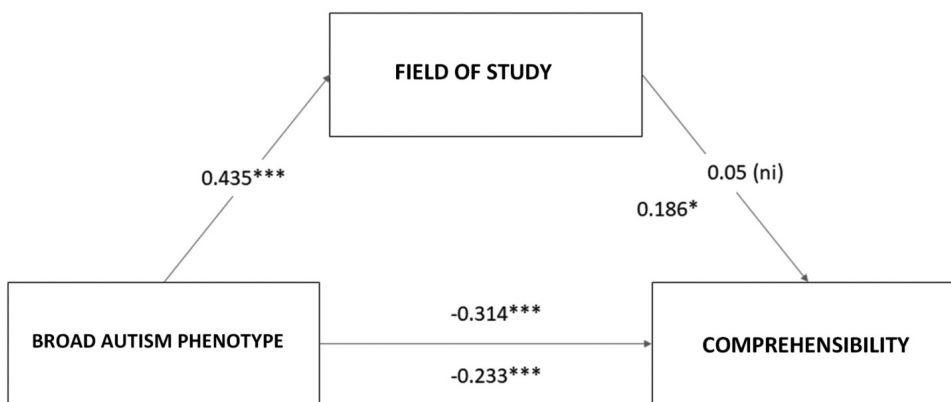


Figure 2. A mediation model of the BAP traits impact on comprehensibility with the field of study as a mediator

sibility the partial mediation effect was obtained ($Z = 2.08, s = 0.09, p = 0.038$). However, despite the lack of the direct correlation between the field of study and comprehensibility ($\beta = 0.050, p = 0.523$), the role of the field of study (as the mediator) and of BAP (the independent variable) in predicting comprehensibility increased in the model including these variables (see Figure 2). Furthermore, although the direct relationship between BAP and comprehensibility remained negative, introducing the field of study as a mediator gave a positive effect (see Table 3 and Figure 2).

DISCUSSION

The findings of the present study can be summarized as follows. The mean intensity of the broad autism phenotype traits among the study participants taken as a whole was lower than the mean obtained in the Polish adaptation of the AQ questionnaire by Baron-Cohen et al. (2001) into Polish. At the same time, higher

intensity of the broad autism phenotype traits in men than in women was found, which agrees with other studies (Baron-Cohen et al., 2001, Hull et al., 2019). It should be noted, however, that there are also studies (e.g., Hurley, Losh, Parlier, Reznick, & Piven, 2007), which argue that certain traits named as specific to BAP, such as sensitivity and specificity of the reaction, are similar in men and women.

Among science students, the percentage of individuals with traits of the broad phenotype of autism is higher than in humanities students. It agrees with other reports (e.g., Ruzich et al., 2015; Windham, Fessel, & Grether, 2009). It does not mean that high functioning individuals with BAP or ASD are exceptionally talented in sciences since there are studies that yielded other results (e.g., Estes et al., 2011; McDougal, Riby, & Hanley, 2020; Peklari, 2019). However, supporting high-functioning children and youth with ASD or BAP in developing these skills can increase their chances of getting an interesting job and developing social skills.

Even though there was not a direct relationship between the intensity of BAP traits and the global sense of coherence, we found significant interrelations of BAP with meaningfulness, comprehensibility, and manageability. The positive correlation between BAP and meaningfulness was a bit of surprise. This motivational dimension of the sense of coherence (Eriksson & Lindström, 2005) enables emotional interpretation of events experienced by an individual, helps to reduce tension related to the experienced stress, and facilitates the achievement of goals (Şek & Pasikowski, 2006). Since the respondents were students of prestigious faculties, such as computer science and mathematics, it likely gave them a feeling of importance and usefulness. Choosing a field of study in line with their own dispositions could have increased their ability to cope with the requirements of the environment. In effect, they became more confident and started to see difficulties as challenges rather than threats (Antonovsky, 2005; Şek, Kaczmarek & Ziarko, 2012).

A negative correlation between BAP and comprehensibility means that the higher intensity of BAP in a given person, the more difficult it may be for him or her to assess stimuli (both external and internal) as consistent, structured, and therefore predictable and transparent (Antonovsky, 2005). When faced with these kinds of problems, these people may feel insecure, especially in social situations that require interactions with other people whose reactions may not always be entirely predictable. Although we found no direct relationship between comprehensibility and the field of study, we attempted to conduct a mediation analysis involving this variable. The mediation obtained appeared to be partial. In the model taking into account both this mediator (scientific discipline) and the independent variable (BAP), the role of both these variables in predicting comprehensibility increased, and the introduction of the field of study as a mediator gave a positive effect. It is worth noting that sciences are more algorithmic than humanities. They are based on data of a finite sequence of clearly defined activities necessary to perform some tasks. In our opinion, the above findings confirm the assumption that the right choice of the field of study results in better manageability. On the

one hand, the preferences of individuals with BAP for science may be driven by the search for a structured and easily predictable job.

The positive relationship between BAP and manageability, as well as no mediation effect of the field of science, is astonishing and calls for further studies taking into account the support of others, mainly relatives and teachers. It is probable that such support enabled the formation of skills to view difficulties as challenges to be overcome (Antonovsky, 2005; Jarmużek, 2014). Therefore, the choice of the field of study may be a derivative of manageability without significantly affecting the relationship between BAP and this variable.

CONCLUSIONS

The study confirmed the higher intensity of the broad autism phenotype traits in men and students of science. However, positive relationships between BAP, meaningfulness, and manageability suggest that the appropriate choice of the field of study plays a significant role in finding meaning in life and in developing an ability to cope with difficulties that might appear. Since the field of study is closely linked to the type of work, it might be assumed that the same role plays by a job that makes sense. It explains the frustration expressed by brain-damaged patients at being unable to work. Clinical data show that allowing such patients to be active in any field restores their sense of meaning in life. The best example is art therapy, which helped patients with various symptoms (see Pačhalska & Góral-Pótróla, 2020; Pačhalska, Góral-Pótróla, & Chojnowska-Ćwiąkała, 2021).

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Address for correspondence:

Krystyna Teresa Panas, PhD
University of Economics and Innovation
Projektowa 4
20-209 Lublin, Poland
e-mail: teresa.panas@wsei.lublin.pl