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**THE DARK TRIAD OF PERSONALITY IN KINDERGARTEN,  
SCHOOL AND UNIVERSITY TEACHERS**

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***Abstract***

The current study focuses on examining the Dark Triad of personality traits (Machiavellism, narcissism, and psychopathy) in representatives of the professional community of teachers belonging to three different levels of the education system. Accordingly, the participants represented three different professional groups of educators: 154 kindergarten teachers, 147 school teachers and 101 university teachers. The total sample comprised 402 participants including 372 women and 30 men aged from 19 to 84 years old ( $M = 32.40$ ,  $SD = 10.30$ ). The Russian-language adaptation of the Short questionnaire of the Dark Triad (SD3) was used for measurements. The one-way analysis of variance (ANOVA) revealed certain significant differences in the expression of the Dark Triad traits between these professional groups. In addition, the results of the correlation analysis showed some differences in the structure of the Dark Triad traits, which were typical for each group of teachers. These results are consistent with the ongoing discussion about the contradictory conclusions of studies of the Dark triad of personality conducted on various professional and social samples allowing us to assume (on the example of teachers types) that the structure of the Dark Triad is profession-specific as it differs even among related professional groups, such as kindergarten, school and university teachers.

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**Keywords:** The Dark Triad of personality, educators, kindergarten teachers, school teachers, university teachers.



## 1. Introduction

The psychological study of such personal traits as Machiavellianism, narcissism and psychopathy (a complex of which is now called the Dark triad of personality) began in the late 19th century, although it was preceded by a long period of contemplation about these traits in the framework of philosophy, medicine, pedagogy, etc.

As a result, psychologists have come to the study of personal features of the Dark Triad based on the significant experience of their predecessors. On this nutritious ground, in the late 19th and early 20th century, many psychologists launched the study of dark personality traits. In particular, narcissism was studied by H. Ellis, S. Freud, P. Nacke et al. (see, e.g., Freud, 1957), psychopathy (as borderline, subclinical syndrome) – by V.M. Bekhterev, S. Freud, E. Kraepelin et al. (see, e.g., Litvintsev, 2017), and Machiavellianism (as a tendency to manipulate people) – by V.M. Bekhterev, S. Freud, C.G. Jung, W. Stern et al. (see, e.g., Bekhterev, 1998, Bereczkei, 2017).

Throughout the 20th century and the beginning of the 21st century (to date), each of the traits of the future Dark Triad was widely studied and received many measuring tools (see, e.g., Chen, 2018, Muris, Merckelbach, Otgaar, & Meijer, 2017).

Thus, individually Machiavellianism, narcissism and psychopathy have been studied in psychology for about a century and a half. At the same time, since the 1990s, a theoretical approach has been developing, within which these personality traits are considered as interrelated manifestations of a common generalized complex – the Dark Triad of personality. In the framework of this study, we rely on the most well-known approach suggested by Paulus and Williams (2002).

The studies of the Dark triad of personality over the past 20 years showed conflicting results. On the one hand, the consideration of Machiavellianism, narcissism, and psychopathy within a single complex has been quite productive: many studies have identified significant relationships between the Dark Triad traits, and their joint determining or moderating influence on behaviour, occupational activities, psychological well-being and other aspects of human life (see, e.g., Cohen, 2016). On the other hand, the concept of the Dark Triad has been repeatedly questioned. For example, many authors note that the relationship between psychopathy and Machiavellianism is much stronger than between narcissism and each of these traits; it has been proposed to reduce the Dark Triad to a Dark Dyad (see, e.g., Persson, Kajonius, & Garcia 2017, Rogoza & Cieciuch, 2018).

However, other authors provide a rationale for the need to expand the Dark Triad – in particular, to the Dark Tetrad (see, e.g., Thomaes, Brummelman, Miller, & Lilienfeld, 2017). Another point of view suggests that the Dark side of the personality is extremely diverse and heterogeneous, so there are many more of its manifestations (traits) than two, three or four (Thomaes et al., 2017, Zeigler-Hill, Besser, Morag, & Campbell, 2016).

The current situation might be assessed as a state of unstable equilibrium: the proponents of each of these positions cite convincing arguments to support it, but this is not enough to refute the competing positions. Under these conditions, the concept of the Dark Triad seems to be the most balanced position potentially allowing for its transformation in the direction of increasing as well as reducing the number of basic traits of the Dark side of personality. At the same time, further development of the conceptual foundations of the Dark side of personality should be based on evidence obtained from empirical studies

including various professional groups. However, the dominant trend in the Dark Triad research in recent years has been the use of non-profession-specific samples:

- student samples (see, e.g., Azizli et al., 2016, Dowgwillo & Pincus, 2017, Jonason, 2015a, Schneider, McLarnon, & Carswell, 2017);
- virtual samples recruited via Internet services such as MTurk, GoogleDocs etc. (see, e.g., Rogoza & Ciecuch, 2017, 2018, Jonason, 2015b);
- population samples (see, e.g., Anderson, & Cheers, 2017, Malesza, Ostaszewski, Büchner, & Kaczmarek, 2017, Vater, Moritz, & Roepke, 2018).

Nevertheless, profession-specific samples are used in few studies (e.g., Tjldink et al., 2016). However, the proportion of studies conducted on such samples in the total amount of Dark Triad research remains small, and many professions have almost not been studied.

## 2. Problem Statement

In the Dark Triad studies, underinvestigated professional groups include teachers representing different levels of education, in particular, kindergarten, school and university teachers.

On the one hand, personality and professional activity of teachers of each of these groups in recent years has been intensively studied. In particular, research on school teachers is widely presented (see reviews in Göncz, 2017, Klassen et al., 2018, Stronge, 2018). In recent years, research has been intensively expanding both on samples of kindergarten teachers (e.g., see review in Lenkov, Rubtsova, & Nizamova, 2017) and university teachers (see, e.g., Tan, Mansi, & Furnham, 2018).

On the other hand, empirical studies of the Dark triad of personality on these groups are rare. For example, O'Boyle, Forsyth, Banks, and McDaniel (2012) performed a meta-analysis that included over 180 Dark Triad studies covering many professions (police officers, salesmen, etc.) but not educators (see O'Boyle, Forsyth, Banks, & McDaniel, 2012).

This situation complicates the comparative analysis of these groups of teachers and the appropriate evidence-based conceptual development of the Dark side of personality.

## 3. Research Questions

This study addresses the following research questions:

- (1) To what extent the Dark triad personality traits are expressed in representatives of professional groups consisting of kindergarten, school and university teachers?
- (2) Are there any significant differences between these groups in the expression of the Dark Triad personality traits?
- (3) Can we say that the factor of the level of education system (with gradations "kindergarten", "school" and "university") significantly affects the expression of the Dark Triad personality traits among teachers?
- (4) Is the structure of the Dark Triad traits the same for these three related professional groups, or does each trait have a similar yet specific structure?
- (5) How does the expression and structure of the Dark triad personality traits of teachers from different groups correlate with similar results obtained in other social and professional groups?

## 4. Purpose of the Study

The aim of the study was to identify the degree of expression of the Dark Triad personality traits as well as the possible specificity of their structure in the context of a comparative analysis of three related professional groups of teachers: kindergarten teachers, school teachers and university teachers.

## 5. Research Methods

### 5.1. Conceptual framework

*The Dark Triad of personality* is considered in accordance with the conceptual notions suggesting that Machiavellianism, narcissism, and psychopathy are three relatively independent personality traits, which however have significant relationships and therefore can be considered as a single complex – integral substructure of the personality determining and mediating various negative manifestations of consciousness, behavior, interpersonal and professional relationships (Paulhus & Williams, 2002; Jones & Paulhus, 2014).

*Professional groups of educators* are considered in accordance with the Russian system of education and professional activity of teachers representing different levels of the system: kindergarten, school and university teachers.

### 5.2. Participants and procedure

Teachers from three different levels of education were invited to participate in the study. Accordingly, the final sample of the study included three professional groups:

- 154 kindergarten teachers – all females aged from 19 to 58 years old ( $M = 31.93$ ,  $SD = 10.44$ ), with work experience ranging from 0.5 to 33 years ( $M = 7.90$ ,  $SD = 8.83$ ); this group is supplemented by a sample of  $n = 129$ , which was used in our previous study (Lenkov, Rubtsova, & Nizamova, 2017);
- 147 school teachers including 135 females (91.8%) and 12 males (8.2%), aged from 21 to 68 years old ( $M = 32.09$ ,  $SD = 9.25$ ), with work experience ranging from 0.5 to 40 years ( $M = 10.01$ ,  $SD = 9.40$ );
- 101 university teachers including 83 females (92.5%) and 18 males (7.5%) aged from 22 to 84 years old ( $M = 33.57$ ,  $SD = 11.49$ ), with work experience ranging from 0.5 to 57 years ( $M = 10.27$ ,  $SD = 11.20$ ).

The characteristics of the overall sample were as follows: 402 teachers including 372 females (82.2%) and 30 males (17.8%) aged from 19 to 84 years old ( $M = 32.40$ ,  $SD = 10.30$ ), with work experience ranging from 0.5 to 57 years ( $M = 9.27$ ,  $SD = 9.71$ ).

Educational institutions (kindergartens, schools and universities) in which the participants worked at the time of the study were located in several regions of Russia including the cities of Moscow, St. Petersburg, Tver, Ulyanovsk and the corresponding districts.

All participants of the study were volunteers and gave informed consent. Participants filled out questionnaires on general information and on the expression of the Dark Triad traits.

### 5.3. The measured variables and the research design

We used three groups of measured variables:

- independent variables represented by three levels of education system: preschool education (kindergarten teachers), school education (school teachers), higher education (university teachers);
- dependent variables: three traits of the Dark triad of personality (Machiavellianism, narcissism and psychopathy), and the overall score defined as the arithmetic mean of these three traits;
- other controlled variables: age and work experience.

The design of the study included:

- calculation of means and intercorrelations of the Dark Triad traits in each group of teachers;
- inter-group comparisons between these groups using one-way analysis of variance (ANOVA);
- comparison of the results obtained on the expression and structural features of the Dark triad traits in teachers with similar research results obtained by other authors on other social and professional groups.

### 5.4. Measures

**The Dark Triad.** To measure the traits of the Dark Triad, we used the "Short Dark Triad (SD3)" questionnaire (Jones & Paulhus, 2014) adapted in the Russian language (Egorova, Sitnikova, & Parshikova, 2015). This questionnaire consists of 27 items and includes three subscales – Machiavellianism, narcissism, and psychopathy (9 items per each). The statements are evaluated on a 5-point Likert scale with gradation from 1 = *strongly disagree* to 5 = *strongly agree*. The questionnaire has satisfactory psychometric properties: for Machiavellianism, narcissism, and psychopathy the Cronbach's alpha is equal to .74, .72, .70, respectively (Egorova et al., 2015).

**Age** was determined as the number of full years at the time of the study.

**Work experience** was defined as the number of years of work in the profession, rounded to .5.

### 5.5. Data analysis

Statistical methods used to analyze the data included one-way analysis of variation (ANOVA), supplemented by post hoc tests; correlation analysis (Pearson correlations); methods of testing statistical hypotheses (Fisher criteria, Levene's test, etc.).

## 6. Findings

### 6.1. Comparison of the Dark Triad traits between groups of teachers

Table 01 shows descriptive statistics and correlations for Dark Triad traits, age and work experience for groups of teachers and the overall sample.

Table 02 shows the results of ANOVA regarding the influence of the factor of the education level (kindergarten, school and university) on the expression of the Dark triad personality traits in teachers.

Application of ANOVA in this study had the following features associated with the choice of post hoc tests for multiple comparisons:

- for Machiavellianism and the overall expression of the Dark Triad we used a post hoc Scheffe test assuming equality of variances; in addition, due to differences in the groups size, we additionally used a post hoc Games-Howell test allowing, in particular, for differences in the group sizes (e.g., see Field, 2009); however, this test showed essentially the same results as the Scheffe test, therefore in Table 02 its results for Machiavellianism and the overall score of the Dark Triad are not shown;
- in turn, for narcissism and psychopathy a number of post hoc tests involving inequality of variances were used in ANOVA (Tamhane test etc.); in Table 02, only the results of the post hoc Games-Howell test are shown, which allows for differences in both variance and group size (see, e.g., Field, 2009) since other post hoc tests gave similar results.

As can be seen from Table 02, ANOVA revealed significant differences in the level of all Dark Triad traits (Machiavellianism, narcissism and psychopathy) as well as in the level of the overall expression of the Dark Triad.

Comparison of the results presented in Tables 01 and 02 shows the following differences between the groups of teachers (see also Figure 01):

- the level of Machiavellianism does not differ statistically between kindergarten teachers and school teachers but is significantly higher ( $p < .01$ ) in university teachers than in the other two groups;
- the lowest level of narcissism is observed in school teachers differing significantly from kindergarten ( $p < .05$ ) and university teachers ( $p < .01$ ), with university teachers showing the highest level, which is significantly higher ( $p < .05$ ) than in kindergarten teachers;
- the level of psychopathy does not differ among kindergarten teachers and university teachers, but is significantly higher for school teachers than for kindergarten teachers ( $p < .01$ ) and university teachers ( $p < .05$ );
- the overall score of the Dark Triad does not differ for kindergarten teachers and school teachers, but is significantly higher for university teachers than for kindergarten ( $p < .01$ ) and school teachers ( $p < .01$ ).

Figure 01 illustrates the differences in the level of the Dark Triad traits between the groups of teachers (*Mac* – Machiavellianism, *Nar* – narcissism, *Psy* – psychopathy, *D3T* – the total score of the Dark Triad of personality).

**Table 01.** Descriptive statistics and correlations

Group	Variable	Descriptive statistics		Correlations				
		Min/Max	M (SD)	WE	Mac	Nar	Psy	D3T
1 (kindergarten teachers, n = 154)	Age	19.0/58.0	31.93 (10.44)	.84**	-.04	-.18*	-.16*	-.17*
	WE	.5/33.0	7.90 (8.83)		-.01	-.14	-.15	-.13
	Mac	1.56/4.22	2.95 (.54)			.24**	.48**	.81**
	Nar	1.44/3.78	2.87 (.51)				.14	.65**
	Psy	1.22/3.00	1.97 (.46)					.72**
	D3T	1.78/3.33	2.60 (.37)					
2 (school	Age	21.0/68.0	32.09 (9.25)	.95**	-.03	-.07	-.16	-.14
	WE	.5/40.0	10.01 (9.40)		.00	-.03	-.15	-.10

teachers, n = 147)	Mac	1.78/4.78	2.92 (.54)			.05	.21**	.68**
	Nar	1.67/3.78	2.72 (.48)				.02	.51**
	Psy	1.22/3.67	2.17 (.58)					.69**
	D3T	1.78/3.41	2.60 (.34)					
3 (university teachers, n = 101)	Age	22.0/84.0	33.57 (11.49)	.98**	.23*	-.24*	-.10	-.04
	WE	.5/57.0	10.27 (11.20)		.26**	-.18	-.07	.03
	Mac	1.67/4.67	3.22 (.50)			-.10	.45**	.74**
	Nar	1.67/4.44	3.03 (.42)				.01	.43**
	Psy	1.22/3.33	2.00 (.42)					.75**
Overall sample (teachers in general, N = 402)	Age	19.0/84.0	32.40 (10.30)	.91**	.05	-.14**	-.14**	-.11*
	WE	.5/57.0	9.27 (9.71)		.08	-.11*	-.11*	-.07
	Mac	1.56/4.78	3.01 (.54)			.15**	.32**	.75**
	Nar	1.44/4.44	2.86 (.49)				.02	.57**
	Psy	1.22/3.67	2.05 (.50)					.67**
Overall sample (teachers in general, N = 402)	D3T	1.78/3.48	2.64 (.34)					

Note. WE – work experience, Mac – Machiavellianism, Nar – narcissism, Psy – psychopathy, D3T – the total score of the Dark Triad of personality.

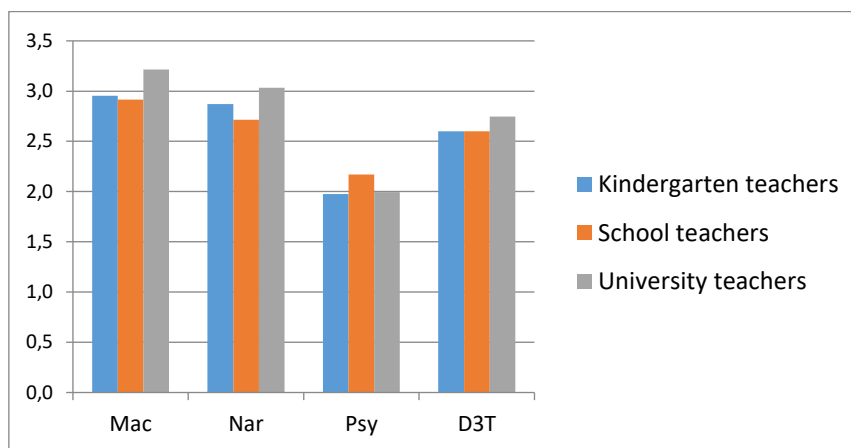
\*  $p < 0.05$  level (2-tailed). \*\*  $p < 0.01$  level (2-tailed).

**Table 02.** [Results of one-way ANOVA and post hoc tests]

Dependent variable	Levene's test $p$	ANOVA statistics				Post hoc tests		
		$F(2, 399)$	$MSE$	$p$	$\eta^2$	test	Groups	$p$
Mac	.279	10.767	.282	.000	.051	Scheffe	1-2	.816
							1-3	.001**
							2-3	.000**
Nar	.032	13.405	.227	.000	.063	Games-Howell	1-2	.017*
							1-3	.019*
							2-3	.000**
Psy	.003	6.793	.246	.001	.033	Games-Howell	1-2	.005**
							1-3	.919
							2-3	.017*
D3T	.055	6.938	.114	.001	.034	Scheffe	1-2	1.000
							1-3	.004**
							2-3	.005**

Note. Mac – Machiavellianism, Nar – narcissism, Psy – psychopathy, D3T – the total score of the Dark Triad of personality; Groups – groups of teachers (1 – kindergarten teachers, 2 – school teachers, 3 – university teachers), Levene's test – Levene's test of homogeneity of variances;  $p$  – the significance level (2-tailed);  $F(2, 399)$  – Fisher statistics, where the number of degrees of freedom ( $df$ ) between groups and within groups were 2 and 399, respectively; Scheffe and Games-Howell – Scheffe and Games-Howell post hoc tests (multiple comparisons), respectively.

\*  $p < 0.05$  (2-tailed). \*\*  $p < 0.01$  (2-tailed).



**Figure 01.** Level of the Dark Triad traits for kindergarten, school and university teachers

Thus, the results of ANOVA suggest that the factor of the level of the education system at which a teacher works affects the expression of the Dark Triad traits in an ambiguous way:

- for Machiavellianism and the overall score for the Dark Triad, it leads to an increase in the transition from the school level to the university level;
- in contrast, there is a drop in the level of narcissism in school teachers with a subsequent significant increase in university teachers;
- finally, unlike the first two cases, for psychopathy there is a "peak" of the level in school teachers with a subsequent decrease in university teachers almost to the lowest level of kindergarten teachers.

The revealed empirical regularities allow us to assume that the structure of the Dark Triad of personality changes non-linearly under the influence of the factor of the level of teachers' professional activity in the educational system.

Table 03 presents the results of comparisons of correlations of the Dark Triad between groups of teachers using Fisher's criterion. As can be seen from Tables 01 and 03, the correlation between age and Machiavellianism does not statistically differ between kindergarten teachers and school teachers, but in university teachers it is significantly stronger ( $p < .05$ ) and positive ( $r = .23$ , see Table 01). In other words, in university teachers the expression of Machiavellianism increases with age. Perhaps this is due to the fact that with age university teachers often get higher academic status (i.e., the share of associate professors or full professor) (for examples of such academic gradations see, e.g., Tjebk et al., 2016).

**Table 03.** The comparison of correlations for the Dark Triad traits across groups of teachers

Correlation	Groups	<i>p</i>	Correlation	Groups	<i>p</i>
Age - Mac	1-2	.932	Age - Psy	1-2	1.000
	1-3	.036*		1-3	.638
	2-3	.045*		2-3	.642
Age - Nar	1-2	.338	Age - D3T	1-2	.792
	1-3	.629		1-3	.311
	2-3	.017*		2-3	.442
WE - Mac	1-2	.932	WE - Psy	1-2	1.000
	1-3	.034*		1-3	.533



	2-3	.043*		2-3	.537
<i>WE - Nar</i>	1-2	.342	<i>WE - D3T</i>	1-2	.794
	1-3	.752		1-3	.216
	2-3	.247		2-3	.321
<i>Mac - Nar</i>	1-2	.096	<i>Nar - Psy</i>	1-2	.300
	1-3	.008**		1-3	.314
	2-3	.252		2-3	.939
<i>Mac - Psy</i>	1-2	.008**	<i>Nar - D3T</i>	1-2	.063
	1-3	.768		1-3	.016*
	2-3	.039*		2-3	.433
<i>Mac - D3T</i>	1-2	.011*	<i>Psy - D3T</i>	1-2	.609
	1-3	.175		1-3	.615
	2-3	.355		2-3	.341

Note: Groups – groups for comparison of correlations (1 – kindergarten teachers, 2 – school teachers, 3 – university teachers), *Mac* – Machiavellianism, *Nar* – narcissism, *Psy* – psychopathy, *D3T* – the total expression of the Dark Triad of personality, *p* – the significance of differences between groups (2-tailed); \*  $p < 0.05$  (2-tailed). \*\*  $p < 0.01$  (2-tailed).

Table 04 represents the Dark Triad studies selected for comparison with the current study. Table 05 shows the levels and intercorrelations of the Dark Triad traits identified in the concerned independent studies. Based on the data presented in Tables 01 and 05, the level of the Dark Triad traits expression obtained in our study was compared with the data of other studies using the Fisher criterion. We will specify the sample code (SC) in accordance with Tables 04 and 05 for each comparison.

**Table 04.** The studies and sample codes for comparison of the Dark Triad traits level and structure

Study	Sample	<i>n</i>	Country or region	Code
Egorova, Sitnikova, and Parshikova (2015)	Group of female from Russian population <sup>a</sup>	334	Russia	C1
	Sample from Russian population <sup>b</sup>	571	Russia	C2
Jones and Paulhus (2014)	Group of female from MTurk for Study 1 <sup>c</sup>	230	Canada and USA	C3
	Sample from MTurk for Study 1 <sup>d</sup>	489	Canada and USA	C4
Jonason, Wee, Li, and Jackson (2014)	Group of female from MTurk for Study 1 <sup>e</sup>	182	USA	C5
	Sample from MTurk for Study 1 <sup>f</sup>	424	USA	C6
Rogoza and Ciecuch (2017, 2018)	Sample formed via Facebook <sup>g</sup>	1012	Poland	C7
Egan, Hughes, and Palmer (2015)	Sample for on-line study via GoogleDocs <sup>h</sup>	380	United Kingdom	C8
Birkás, Gács, and Csathó (2016)	under-, and postgraduate students <sup>i</sup>	200	Hungary	C9
Egan, Chan, and Shorter (2014)	Sample formed via Facebook and Internet-based research sites <sup>j</sup>	840	USA, Canada, Europe et al.	C10
Jonason (2015b)	Study 1: university students and participants from MTurk <sup>k</sup>	1745	Canada and USA	C11
Tijdink et al. (2016)	biomedical university scientists <sup>l</sup>	535	Netherlands	C12

Note. Code – sample code to present research results (see Table 05). MTurk – Amazon’s Mechanical Turk.

<sup>a</sup> 100% females; data for age is only provided for the whole sample ( $n = 571$ ): age range 16–84 years,  $M (SD) = 35.18 (14.10)$  [Egorova, Sitnikova, & Parshikova, 2015]. <sup>b</sup> 41.5% males, 58.5% females; age range 16–84 years,  $M (SD) = 35.18 (14.10)$

[Egorova et al., 2015]. <sup>c</sup> 100% females; data for age is only provided for the whole sample ( $n = 479$ ):  $M (SD) = 30.72 (11.09)$  [Jones & Paulhus, 2014]. <sup>d</sup> 53% males, 47% females; for age  $M (SD) = 30.72 (11.09)$  [Jones & Paulhus, 2014]. <sup>e</sup> 100% females; from various jobs; data for age is only provided for the whole sample ( $n = 424$ ): age range 18–72 years,  $M (SD) = 32.27 (10.32)$  [Jonason, Wee, Li, & Jackson, 2014]. <sup>f</sup> 53% males, 47% females; with various jobs (e.g., telecom, education, healthcare, non-profit et al.); age range 18–72 years,  $M (SD) = 32.27 (10.32)$  [Jonason et al., 2014]. <sup>g</sup> 20.0% males, 80.0% females (Rogoza & Ciecuch, 2017, 2018); age information is calculated from the data presented in the original article by Rogoza and Ciecuch (2017, 2018) separately for males and females: age range 17–35 years,  $M (SD) = 22.36 (3.44)$  [see Rogoza & Ciecuch, 2017, 2018]. <sup>h</sup> 28.7% males, 71.3% females; age range 18–83 years,  $M (SD) = 37.99 (16.50)$  [Egan, Hughes, & Palmer, 2015]. <sup>i</sup> 41.0% males, 59.0% females; age range 18–38 years,  $M (SD) = 26.43 (5.78)$  [Birkás, Gács, & Csathó, 2016]. <sup>j</sup> 29.3% males, 70.7% females; for age  $M (SD) = 30.1 (12.7)$ ; the mean years of education for the sample was 15.0 ( $SD = 3.8$ ) [Egan, Chan, & Shorter, 2014]. <sup>k</sup> 33.0% males, 67.0% females (Jonason, 2015b); age information is calculated from the data presented in the original article by Jonason (2015b) separately for a group of students ( $n = 941$ ) and a group from MTurk ( $n = 804$ ): age range 16–76 years,  $M (SD) = 25.07 (10.59)$  [see Jonason, 2015b]. <sup>l</sup> 42.8% males, 57.2% females; for age 74% less 40 years, 26% more 40 years; years working as a scientist: 0–4 41.1%, 5–10 29.5%, 11–15 8.6%, 16–20 6.7%, 21–25 4.7%, >25 9.2% (Tijndik et al., 2016, p. 6).

**Kindergarten teacher.** The level of Machiavellianism among kindergarten teachers obtained in this study is consistent with the results reported by Jonason, Wee, Li and Jackson (2014) [ $SC = C5, p = .247$ ] but significantly lower than the level reported for women groups by Egorova, Sitnikov, and Parshikova (2015) [ $SC = C1, p = .005$ ] and Jones and Paulhus (2014) [ $SC = C3, p = .000$ ]. The level of narcissism in kindergarten teachers obtained in this study does not statistically differ from the result, which was reported by Jones and Paulhus (2014) [ $p = .080$ ] but significantly higher than the results by Jonason et al. (2014) [ $p = .000$ ] and the results on a group of women reported by Egorova et al. (2015) [ $p = .038$ ]. The level of psychopathy among kindergarten teachers obtained in this study is consistent with the results for groups of women reported by Egorova et al. ( $p = .860$ ) and Jones and Paulhus (2014) [ $p = .856$ ] but significantly higher than the levels reported by Jonason et al. ( $p = .029$ ).

**Table 05.** Levels and intercorrelations of the Dark Triad traits in studies

Sample code	<i>M (SD)</i>			Intercorrelations		
	<i>Mac</i>	<i>Nar</i>	<i>Psy</i>	<i>Mac - Nar</i>	<i>Mac - Psy</i>	<i>Nar - Psy</i>
C1 <sup>a</sup>	3.13 (0.70)	2.73 (0.76)	1.96 (0.63)	-	-	-
C2 <sup>a</sup>	3.27 (0.70)	2.78 (0.73)	2.11 (0.66)	.31**	.35**	.42**
C3 <sup>b</sup>	3.27 (0.56)	2.78 (0.48)	1.96 (0.57)	-	-	-
C4 <sup>b</sup>	3.34 (0.54) <sup>j</sup>	2.85 (0.47) <sup>j</sup>	2.12 (0.61) <sup>j</sup>	.18**	.50**	.34**
C5 <sup>c</sup>	2.88 (0.56)	2.60 (0.57)	1.84 (0.60)	-	-	-
C6 <sup>c</sup>	3.03 (.57)	2.70 (0.63)	2.05 (.64)	.16** <sup>n</sup>	.47** <sup>n</sup>	.32** <sup>n</sup>
C7 <sup>d</sup>	3.08 (0.61)	2.85 (0.57)	2.14 (0.54)	.25**	.57**	.28**
C8 <sup>e</sup>	3.04 (0.58) <sup>k</sup>	2.67 (0.59) <sup>k</sup>	1.96 (0.54) <sup>k</sup>	-	-	-
C9 <sup>f</sup>	3.03 (0.69) <sup>l</sup>	2.73 (0.67) <sup>l</sup>	2.32 (0.68) <sup>l</sup>	-	-	-
C10 <sup>g</sup>	2.83 (0.58)	2.70 (0.63)	3.27 (0.70)	-	-	-
C11 <sup>h</sup>	-	-	-	.38**	.27**	.51**
C12 <sup>i</sup>	2.77 (.47) <sup>m</sup>	2.80 (.45) <sup>m</sup>	2.02 (.45) <sup>m</sup>	.24** <sup>m</sup>	.42** <sup>m</sup>	.37** <sup>m</sup>

Note. Sample code – code of the sample according to Table 04. *Mac* – Machiavellianism, *Nar* – narcissism, *Psy* – psychopathy.

\* Correlation is significant at the level of  $p < .05$  (2-tailed). \*\* Correlation is significant at the level of  $p < .01$  (2-tailed).

<sup>a</sup> data by Egorova, Sitnikova, and Parshikova (2015), see Table 04. <sup>b</sup> data by Jones and Paulhus (2014), see Table 04. <sup>c</sup> data by Jonason, Wee, Li, and Jackson (2014), see Table 04. <sup>d</sup> data by Rogoza and Ciecuch (2017, 2018), see Table 04. <sup>e</sup> data by Egan, Hughes, and Palmer (2015), see Table 04. <sup>f</sup> data by Birkás, Gács, and Csathó (2016), see Table 04. <sup>g</sup> data by Egan, Chan, and Shorter (2014), see Table 04. <sup>h</sup> data by Jonason (2015b), see Table 04. <sup>i</sup> data by Tijndik et al. (2016), see Table 04. <sup>j</sup> calculated from the data provided in the original article separately for males and females (see Jones & Paulhus, 2014, p. 33). <sup>k</sup> calculated

with the data and the method provided in the original article, the sum of points on a subscale is not divided by the number of points (i.e., 9) [see Egan, Hughes, & Palmer, 2015].<sup>l</sup> calculated with the data and the method provided in the original article, the sum of points on a subscale is not divided by the number of points (i.e., 9) [see Birkás, Gács, & Csathó, 2016, p. 135].<sup>m</sup> calculated from the primary data provided in the S1 Dataset file (retrieved from <https://doi.org/10.1371/journal.pone.0163251.s002>) in Supporting Information for the original article by Tjldink et al. (2016).<sup>n</sup>  $n = 422$  (see Jonason, Wee, Li, & Jackson, 2014, , p. 120).

**School teachers.** The level of Machiavellianism among school teachers obtained in the present study is significantly lower than the results reported by Egorova, Sitnikova, and Parshikova (2015) [ $SC = C2, p = .000$ ], Jones and Paulhus (2014) [ $SC = C4, p = .000$ ], Jonason, Wee, Lee and Jackson (2014) [ $SC = C6, p = .042$ ], Egan, Hughes, and Palmer (2015) [ $SC = C8, p = .030$ ] and Egan, Chan, and Shorter (2014) [ $SC = C9, p = .080$ ]. The level of narcissism among school teachers is not statistically different from the results reported by Egorova et al. (2015) [ $p = .345$ ], Jonason et al. (2014) [ $p = .726$ ], Egan et al. (2015) [ $p = .360$ ] and Egan et al. (2014) [ $p = .714$ ], but is significantly lower than the levels reported by Jones and Paulhus (2014) [ $p = .004$ ]. The level of psychopathy among school teachers in this study is consistent with the results reported by Egorova et al. ( $p = .315$ ), Jones and Paulhus (2014) [ $p = .380$ ] and Egan et al. (2014) [ $p = .069$ ], but it is significantly higher than in the results reported by Jonason et al. ( $p = .045$ ) and Egan et al. (2015) [ $p = .000$ ].

**University teachers.** The level of Machiavellianism in university teachers in this study does not differ from the results reported by Egorova, Sitnikova, and Parshikova (2015) [ $SC = C2, p = .492$ ] but is significantly higher than the results reported by Jonason, Wee, Lee and Jackson (2014) [ $SC = C6, p = .002$ ], Egan, Hughes, and Palmer (2015) [ $SC = C8, p = .005$ ], Egan, Chan, and Shorter (2014) [ $SC = C10, p = .000$ ] and Tjldink et al. (2016) [ $SC = C12, p = .000$ ] and significantly lower than the results reported by Jones and Paulhus (2014) [ $SC = C4, p = .040$ ]. The level of narcissism among university teachers in this study is significantly higher than the results of all studies selected for comparison: Egorova et al. (2015) [ $p = .001$ ], Jones and Paulhus (2014) [ $p = .000$ ], Jonason et al. (2014) [ $p = .000$ ], Egan et al. (2015) [ $p = .000$ ], Egan et al. (2014) [ $p = .000$ ] and Tjldink et al. (2016) [ $p = .000$ ]. The level of psychopathy among university teachers in this study is consistent with the results of all studies used for comparison: Egorova et al. ( $p = .492$ ), Jones and Paulhus (2014) [ $p = .060$ ], Jonason et al. ( $p = .455$ ), Egan et al. (2015) [ $p = .490$ ], Egan et al. (2014) [ $p = .270$ ] and Tjldink et al. (2016) [ $p = .679$ ].

**Teachers from all three groups.** The level of Machiavellianism in all teachers in this study is consistent with the results reported by Jonason, Wee, Li, and Jackson (2014) [ $SC = C6, p = .605$ ], Egan, Hughes, and Palmer (2015) [ $SC = C8, p = .454$ ] and Birkás, Gács, and Csathó (2016) [ $SC = C9, p = .697$ ], but is significantly higher than the results reported by Egan, Chan, and Shorter (2014) [ $SC = C10, p = .000$ ] and lower than the results reported by Egorova, Sitnikova, and Parshikova (2015) [ $SC = C2, p = .000$ ], Jones and Paulhus (2014) [ $SC = C4, p = .000$ ], Rogoza and Ciecuch (2018) [ $SC = C7, p = .045$ ]. The level of narcissism among teachers from all groups in this study does not differ from the results reported by Egorova et al. (2015) [ $p = .056$ ], Jones and Paulhus (2014) [ $p = .758$ ], Rogoza and Ciecuch (2018) [ $p = .757$ ] but is significantly higher than the results reported by Jonason et al. (2014) [ $p = .000$ ], Egan et al. (2015) [ $p = .000$ ], Birkás et al. (2016) [ $p = .007$ ], Egan et al. (2014) [ $p = .000$ ]. The level of psychopathy among teachers in this study is consistent with the results reported by Egorova et al. ( $p = .124$ ), Jones and Paulhus (2014) [ $p = .066$ ], Jonason et al. (2014) [ $p = 1.000$ ], Egan et al. (2014) [ $p = .572$ ] but is significantly

higher than the results reported by Egan et al. (2015) [ $p = .016$ ] and is significantly lower than the results reported by Rogoza and Ciecuch (2018) [ $p = .004$ ] and Birkás et al. ( $p = .000$ ).

Thus, the expression of Machiavellianism, narcissism and psychopathy among teachers in general and different groups has its specifics – professional, on the one hand, and cross-cultural on the other hand.

## 6.2. Comparison of the Dark Triad traits correlations across studies

For the comparison of correlations in the structure of the Dark Triad traits, we only used those studies presented in Table 04 which reported the required correlations (see Table 05).

Based on the data presented in Tables 01 and 05, the intercorrelations of the Dark Triad traits obtained in our study for different groups of teachers were compared with the data of other studies using the Fisher criterion. We specify the *SC* – sample code in accordance with Tables 04 and 05 for the compared samples.

**Kindergarten teachers.** The correlation between Machiavellianism and narcissism among kindergarten teachers in this study corresponds to the result by Egorova, Sitnikova, and Parshikova (2015) [ $SC = C2, p = .408$ ], as does the correlation between Machiavellianism and psychopathy ( $p = .086$ ). At the same time, the correlation between narcissism and psychopathy in kindergarten teachers obtained in this study is significantly higher than the results reported by Egorova et al. (2015) [ $p = .001$ ].

**School teachers.** The correlation between Machiavellianism and narcissism among school teachers in this study is consistent with the results reported by Jones and Paulhus (2014) [ $SC = C4, p = .165$ ] and Jonason, Wee, Lee and Jackson (2014) [ $SC = C6, p = .250$ ], significantly less strong than the obtained by Egorova, Sitnikova, and Parshikova (2015) [ $SC = C2, p = .004$ ]. The correlation between Machiavellianism and psychopathy among school teachers obtained in this study does not statistically differ from the results reported by Egorova et al. (2015) [ $p = .103$ ] but it is significantly weaker than those obtained by Jones and Paulhus (2014) [ $p = .000$ ] and Jonason et al. (2014) [ $p = .002$ ]. The correlation between narcissism and psychopathy among school teachers obtained in this study is less strong than that reported by Egorova et al. ( $p = .000$ ), Jones and Paulhus (2014) [ $p = .000$ ], Jonason et al. ( $p = .001$ ).

**University teachers.** The correlation between Machiavellianism and narcissism among university teachers obtained in this study is weaker than the ones obtained by Egorova, Sitnikov, and Parshikova (2015) [ $SC = C2, p = .000$ ], Jones and Paulhus (2014) [ $SC = C4, p = .011$ ], Jonason, Wee, Lee and Jackson (2014) [ $SC = C6, p = .020$ ] and Tjardink et al. (2016) [ $SC = C12, p = .002$ ]. The correlation between Machiavellianism and psychopathy among university teachers in this study does not differ from the results obtained by Egorova et al. (2015) [ $p = .276$ ], Jones and Paulhus (2014) [ $p = .560$ ], Jonason et al. (2014) [ $p = .821$ ] and Tjardink et al. (2016) [ $p = .737$ ]. The correlation between narcissism and psychopathy among university teachers obtained in this study is weaker than those reported by Egorova et al. ( $p = .000$ ), Jones and Paulhus (2014) [ $p = .002$ ], Jonason et al. ( $p = .004$ ) and Tjardink et al. (2016) [ $p = .001$ ].

**Teachers from all three groups.** The correlation between Machiavellianism and narcissism among teachers in general in this study does not differ from the results obtained by Jones and Paulhus (2014) [ $SC = C4, p = .648$ ], Jonason, Wee, Li and Jackson (2014) [ $SC = C6, p = .884$ ], Rogoza and Ciecuch (2017)

[ $SC = C7$ ,  $p = .078$ ] but is significantly weaker than those obtained by Egorova, Sitnikova, and Parshikova (2015) [ $SC = C2$ ,  $p = .0096$ ] and Jonason (2015b) [ $SC = C11$ ,  $p = .000$ ]. The correlation between Machiavellianism and psychopathy among teachers in this study is consistent with the results obtained by Egorova et al. (2015) [ $p = .605$ ], Jonason (2015b) [ $p = .315$ ] but is weaker than those obtained by Jones and Paulhus (2014) [ $p = .001$ ], Jonason et al. (2014) [ $p = .011$ ] and Rogoza and Ciecuch (2017) [ $p = .000$ ]. The correlation between narcissism and psychopathy among teachers in this study is weaker than those obtained by Egorova et al. ( $p = .000$ ), Jones and Paulhus (2014) [ $p = .000$ ], Jonason et al. (2014) [ $p = .000$ ], Rogoza and Ciecuch (2017) [ $p = .000$ ] and Jonason (2015b) [ $p = .000$ ].

Thus, some results of our study are in good agreement with the results of other studies, while others are significantly different, which makes them most interesting as it is possible to identify the professional and cross-cultural specificity of the concerned groups of teachers.

### 6.3. The types of the Dark Triad traits structure

The comparison of the results of our study with many other studies on the Dark Triad of personality measured with the same tool, the short Dark Triad (SD3), has allowed us to conclude that there are at least three qualitatively different types of structure of the Dark Triad traits from in terms of intercorrelations between the Dark Triad traits.

Conventionally and schematically, these types can be designated as follows:

- Type 1 can be called a "full triad", with strong associations between all the traits of the triad; this type is the most common and is found in studies conducted on samples of students, population samples, random MTurk samples et al. (see, e.g., Rogoza & Ciecuch, 2017, Jonason, 2015b); this type is also revealed for some professional samples (e.g., Tjldink et al., 2016);
- Type 2 can be called a "weakened triad", with two of the three intercorrelations of the Dark Triad traits being sufficiently strong, among which there is necessarily a correlation of Machiavellianism with psychopathy, but one of the correlations is much weaker than the other two, or completely disappears (becomes non-significant); therefore, this weakened correlation might be the correlation of narcissism with either Machiavellianism or psychopathy: the first case was identified, for example, in the studies of Jones and Paulhus (2014), Jonason, Wee, Lee, and Jackson (2014), as well as in this study for kindergarten teachers and teachers in general (see Table 01); the second type was identified, for example, in a study by Jonason, Baughman, Carter, and Parker (2015);
- Type 3 (Dyad) describes the situation when the correlation of Machiavellianism and psychopathy is quite high, while the correlations of narcissism with Machiavellianism and psychopathy are significantly weaker or absent (non-significant); this type was identified in this study for school and university teachers (see Table 01).

For type 3 (Dyad) identified in our study, we did not find any cases of its manifestation in the results of other studies conducted using the questionnaire "Short Dark Triad (SD3)" (Jones & Paulhus, 2014). However, this type is similar to the above-mentioned version of the structure of the Dark Triad, which includes two elements: one is narcissism, and the second one is a factor formed by the joint influence of

Machiavellianism and psychopathy (see, e.g., Rogoza & Ciecuch, 2018). At the same time, complex, changeable associations among the Dark Triad traits support the idea that Machiavellianism, psychopathy and narcissism are complex systems consisting of many separate personality traits, and therefore should be viewed as multidimensional configurations of traits (e.g, Thomaes, Brummelman, Miller, & Lilienfeld, 2017, p. 835).

## 7. Conclusion

In general, the results obtained in this study provide confirmation of the following regularities:

- for different professional groups of teachers the expression of the Dark Triad traits changes non-linearly under the influence of the factor of the level of teachers' professional activity in the education system;
- the effect of the level of professional activity differs for different traits of the Dark Triad;
- there are different types of the structure of the Dark Triad traits manifested in certain social or professional groups;
- school teachers are characterized by the highest (among all examined groups of teachers) levels of psychopathy; this fact should be taken into account in the organization of work on the preservation of mental health and prevention of professional deformations in the personality;
- university teachers are characterized by the highest (among all the examined groups of teachers) levels of Machiavellianism; this fact should be taken into consideration in the context of the universities functioning and development of productive organizational culture.

The lack of data of independent studies conducted on the same groups of teachers makes it difficult to assess the reliability (non-randomness) of the identified effects; accordingly, it is necessary to reproduce the identified patterns on new independent samples of teachers of different levels of the education system.

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