

Article

Psychological Wellbeing of Adolescents Gifted in Math, Humanities and Sports: Comparative Analysis

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Abstract: Current article presents the study of psychological wellbeing of adolescents (n=168, age 15-17) gifted in math, humanities and sports and educated in advanced programs for gifted children. Theoretical framework of this study is eudemonic concept of psychological wellbeing by C. Ryff. Psychological wellbeing is measured with Ryff wellbeing scales in Russian adaptation by L.V. Zhukovskaya and E.G. Troshikhina. The study is aimed at understanding differences in psychological wellbeing of gifted teenagers connected to gender and type of giftedness. The results suggest that general wellbeing score did not differ for adolescents with different types of giftedness or of different genders. Separate components of psychological wellbeing, such as purpose in life and self-acceptance, are influenced by activity connected to the talent. Gender differences are subjected to age-specific trends of personal development in adolescence. Type of giftedness might reinforce these trends.

Keywords: psychological wellbeing, gifted teenagers, giftedness in math, giftedness in humanities, giftedness in sports.

1. Introduction

Recent psychological studies pay special attention to psychological wellbeing of gifted children and teenagers considering wellbeing as a necessary condition for their self-fulfillment in both professional activities and personal development [1,2]. The World Health Organization places gifted children to a risk group for personal and social development. In this regard it is important to apprehend the link between psychological wellbeing and giftedness in order to solve emerging tasks in psychological and educational practice.

Psychological wellbeing is defined as a relevant reflection of assessing one's current personal functioning according to implementation of her/his potential to a maximum extent which is subjectively expressed in satisfaction with oneself and one's own life. According to C. Ryff [3,4] there are 6 factors of psychological wellbeing (purpose in life, autonomy, environmental mastery, personal growth, positive relations with others, and self-acceptance). In self-determination theory, R. Ryan and E. Deci emphasize that psychological wellbeing is determined by ability to make personal choice and personally improve [5,6]. Thus, psychological wellbeing is not reduced to subjective happiness, it reflects meaningfulness of person's life and the nature of attitudes to life's different aspects.

Although studies of psychological wellbeing of gifted children are popular in psychology, their results are contradictory. On the one hand, a number of studies argue that gifted children tend to have higher estimates of psychological wellbeing than children with regular levels of abilities. The results were confirmed for American, Turkish and Russian samples [7,8,9,10], as well as by metaanalytic studies [11]. On the other hand, other studies revealed a decline in psychological wellbeing of gifted children [12,13]. There are also a number of studies that conclude that gifted children do not differ in psychological wellbeing from other children [14,15,16].

Such inconsistency might be explained by various reasons. First, understanding of giftedness isn't conclusive; therefore authors could rely on different criteria to include children in the gifted group. According to analysis of theoretical models of giftedness, B. Hardera, W. Vialleb and A. Ziegler point to five methods of identification of giftedness [17]. The variety of inclusion criteria lead to the difficulties in comparison of results obtained by separate studies [18]. Second, estimates of psychological wellbeing of gifted children might be influenced by the variety of types of giftedness [2,19]. Most of the studies include teenagers with intellectual/ academically proved giftedness. However, even this group is not homogenous in parameters of psychological wellbeing [11]. Third, the contradiction in results might reflect on the connection between psychological wellbeing and parameters of age and gender. Several studies demonstrate that girls tend to have higher estimates of psychological wellbeing than boys in both gifted and general groups [11,20,21]. On the contrary, gifted girls may have lower levels of psychological wellbeing [22], especially in the cases of math-related giftedness [23]. Also, several authors argue that psychological wellbeing decrease starting from middle to older teen ages [21,24,25]. According to the meta-analysis by T. Jones, however, for gifted children age-related decline in psychological wellbeing was not statistically significant [11].

Age, gender and type of giftedness may influence on the estimate of psychological wellbeing of gifted children. Considering the samples of gifted children selected by common criteria, authors of the current article seek to compare psychological wellbeing of teenagers with giftedness in sports, math and humanities and answer the following study questions:

- Does psychological wellbeing of gifted children differ according to type of giftedness (in math, humanities and sports)?
- Does psychological wellbeing differ for adolescents of different genders?

2. Materials and Methods

Research sample consists of 168 teenagers (age 15-17, mean age $16,00 \pm 0,69$) with giftedness in math ($n=79$), humanities ($n=50$) and sports ($n=39$). 63 respondents were girls, 105 were boys. Sample composition was approached with expert estimates [26,27,28]. An inclusion criterion was competitive admission into specialized educational programs for gifted children. Sample of gifted in math consists of pupils of the Presidential physics and mathematics lyceum (Saint Petersburg) qualified for advanced mathematics programs. Sample of gifted in humanities includes pupils of humanities-related classes of the Center for gifted children (Nizhny Novgorod) qualified for advanced programs in humanities. Sample of gifted in sports comprises pupils of sport schools of Olympic Reserve (Saint Petersburg), qualified for advanced programs in competitive teams sports (synchronized swimming, water polo, football). Choice of giftedness spheres was conditioned by suggestion that types of activities might influence on psychological wellbeing in general and/ or its components independently [29,30,31,32]. Sample description is provided in Table 1.

Table 1. Sample description.

Samples	Male		Female	
	n	Age, mean \pm sd	n	Age, mean \pm sd
Gifted in math	62	16,2 \pm 0,71	17	16,2 \pm 0,81
Gifted in humanities	14	16,1 \pm 0,36	10	16,2 \pm 0,95
Gifted in sports	47	15,4 \pm 0,49	36	15,7 \pm 0,47
Total	105	16,1 \pm 0,70	63	15,9 \pm 0,67

Psychological wellbeing was measured with Ryff scales of psychological wellbeing [33]. There are several adaptations of this questionnaire in Russian [34,35]. In our study we used 54-item version translated and adapted for Russian samples, including the teenager sample, by L.V. Zhukovskaya and E.G. Troshikhina [36]. All 6 components (purpose in life, autonomy, environmental mastery, personal growth, positive relations with others, and self-acceptance) and a total wellbeing were

estimated. Ethical committee of Herzen State Pedagogical University by decision no. 5 from 28.01.2019 approved program and protocol of the study.

Data analysis was performed with RStudio, version 1.1.463. Descriptive statistics were calculated with dplyr package version 0.8.0.1. Regression analysis with 2 possible predictors (gender and type of giftedness) and their interaction was performed with standard (lm) function for general wellbeing score and each component separately. Due to the unbalanced design and possibility of interaction between independent variables, we used type III ANOVA table for our models [37]. Estimated marginal means for contrasts were calculated with emmeans package version 1.3.4. Normality check for models' residuals was performed with Shapiro-Wilk test, homogeneity of variances was estimated with Bartlett test, autocorrelations were checked with Durbin-Watson statistic. All check tests were insignificant.

3. Results

3.1. Type of giftedness and gender

Among both sport-gifted respondents and math-gifted respondents, in our study there were more boys than girls. More girls, however, were gifted in humanities (see Table 2). This difference was statistically significant (Chi-squared = 36.341, df = 2, p-value = 0.00000001285). Although it might be a sample-specific effect, we would argue that gender gaps in both math and humanities are typical for modern Russian society: by default STEM subjects are considered more appropriate for boys, while reading/vocabulary-related subjects are preferable for girls. To account for this effect, we included the interaction component between gender and type of giftedness in regression models.

Table 2. Gender prevalence in gifted groups.

	n		% in type of giftedness	
	female	male	female	male
Gifted in math	17	62	21.52	78.48
Gifted in sports	10	29	25.64	74.36
Gifted in humanities	36	14	72.00	28.00

3.2. Wellbeing components description

Respondents in our study had approximately the same levels of general wellbeing than respondents from general sample of students reported in the adaptation study [36]. However, they have higher median estimates in autonomy (median difference is 3.0), environmental mastery (median difference is 1.0) and personal growth (median difference is 2.0); and lower estimates of positive relations (median difference is -1.0), purpose in life (median difference is -1.0) and self-acceptance (median difference is -0.5). This might indicate that these wellbeing components are deficient in gifted teenagers. Detailed discussion of comparison with general sample is a topic for a separate study. Descriptive statistics of wellbeing components are reported in Table 3.

Table 3. Descriptive statistics of wellbeing scales.

	Mean	SD	Median	Mad	Min	Max
Autonomy	32.82	5.25	33.0	5.93	19	45
Environmental competence	29.83	5.27	30.0	5.93	19	45
Personal growth	35.64	4.88	36.0	5.19	20	45
Positive relations	32.61	6.07	33.0	7.41	19	44
Purpose in life	32.88	6.47	33.0	7.41	15	45
Self-acceptance	32.04	6.37	32.5	6.67	11	45
General wellbeing	195.82	24.63	194.5	25.95	138	250

3.3. Wellbeing components by gender and type of giftedness

General wellbeing scores for all gifted types and all genders did not differ. However, the separate component scores were associated with certain gender and type of giftedness (see Table 4). For girls, autonomy component was by mean estimate 2.89 lower than for boys in general, and even more so - 4.44 points lower, - for girls gifted in humanities. Gifted boys seem more independent of social pressure than girls. Also environmental mastery was 2.22 points lower for girls than boys, and it was specifically low in the group of gifted in sports. Being more independent, boys at the same time know well how to use environment for their benefit. On the other hand, girls have 2.22 higher estimates of personal growth, especially girls who are gifted in sports. As they usually achieve results earlier in their carrier, girls in sports might develop sense of personal success and therefore feel personal growth. Girls also are more capable of building intimate empathic relationships than boys (by mean estimate 2.36), even more so in the group of gifted in math (see Table 5). Teenagers gifted in math lack goal orientation, compared to both peers gifted in humanities (by 3.85 points) and peers gifted in sports (by 4.37 points). Self-acceptance was more or less similar for all groups of teenagers, but for girls gifted in humanities it was significantly lower (by 4.29 points) than for boys from the same group.

Table 4. Contrasts for linear models of wellbeing components (general score, autonomy, environmental mastery, personal growth) by gender and type of giftedness.

Variable	Contrast	General wellbeing ²			Autonomy ³			Environmental mastery ⁴			Personal growth ⁵		
		Est.	SE	p	Est.	SE	p	Est.	SE	p	Est.	SE	p
Gender													
	F-M ¹	-1	4.51	0.824	-2.89	0.95	0.002	-2.22	0.95	0.021	2.22	0.87	0.011
Type of Giftedness													
	MA-SP	-7.78	5.57	0.345	1.56	1.18	0.381	-1.80	1.18	0.280	0.62	1.07	0.830
	MA-HU	-10.55	5.08	0.098	-0.73	1.07	0.775	-0.88	1.07	0.691	-1.38	0.98	0.332
	SP-HU	-2.77	5.89	0.885	-2.29	1.24	0.158	0.92	1.24	0.740	-2.01	1.13	0.181
Type: Gender													
	MA:F-M	5.49	6.67	0.411	-1.35	1.41	0.340	-1.61	1.41	0.255	2.33	1.28	0.070
	SP:F-M	1.22	8.93	0.891	-2.89	1.88	0.126	-4.29	1.89	0.024	4.06	1.72	0.019
	HU:F-M	-9.71	7.67	0.207	-4.44	1.62	0.006	-0.75	1.62	0.644	0.27	1.47	0.852

¹ Abbreviations stand for: F-female, M-male, MA-gifted in math, SP – gifted in sports, HU – gifted in humanities.

² Statistics for General wellbeing model: $R^2_{adj}=0.022$, $p=0.124$, F-statistic: 1.758 on 5 and 162 DF.

³ Statistics for Autonomy model: $R^2_{adj}=0.042$, $p=0.034$, F-statistic: 2.48 on 5 and 162 DF.

⁴ Statistics for Environmental mastery model: $R^2_{adj}=0.044$, $p=0.031$, F-statistic: 2.532 on 5 and 162 DF.

⁵ Statistics for Personal growth model: $R^2_{adj}=0.080$, $p=0.002$, F-statistic: 3.886 on 5 and 162 DF.

Table 5. Contrasts for linear models of wellbeing components (positive relations, purpose in life, self-acceptance) by gender and type of giftedness.

Variable	Contrast	Positive relations ²			Purpose in life ³			Self-acceptance ⁴		
		Est.	SE	p	Est.	Est.	SE	p	Est.	Est.
Gender										
	F-M ¹	2.36	1.07	0.029	0.56	2.36	1.07	0.029	0.56	2.36
Type of Giftedness										
	MA-SP	-2.59	1.33	0.128	-4.37	-2.59	1.33	0.128	-4.37	-2.59
	MA-HU	-1.10	1.21	0.632	-3.85	-1.10	1.21	0.632	-3.85	-1.10
	SP-HU	1.48	1.40	0.541	0.51	1.48	1.40	0.541	0.51	1.48
Type: Gender										

MA:F-M	4.59	1.59	0.004	-1.37	4.59	1.59	0.004	-1.37	4.59
SP:F-M	1.73	2.13	0.416	4.33	1.73	2.13	0.416	4.33	1.73
HU:F-M	0.76	1.83	0.677	-1.27	0.76	1.83	0.677	-1.27	0.76

¹ Abbreviations stand for: F-female, M-male, MA-gifted in math, SP – gifted in sports, HU – gifted in humanities.

² Statistics for Positive relations model: $R^2_{adj}=0.086$, $p=0.001$, F-statistic: 4.151 on 5 and 162 DF.

³ Statistics for Purpose in life model: $R^2_{adj}=0.054$, $p=0.015$, F-statistic: 2.922 on 5 and 162 DF.

⁴ Statistics for Self-acceptance model: $R^2_{adj}=0.056$, $p=0.013$, F-statistic: 2.983 on 5 and 162 DF.

4. Discussion

Our results revealed that general wellbeing of teenagers gifted in math, humanities and sports don't have significant differences in both total sample and samples subdivided by gender. At the same time there were differences in components of wellbeing. This result is confirmed in other studies such as studies by M. Neihart, T. Jones [2,11,19].

According to regression models, components of wellbeing are connected to gender and type of giftedness. This is partially explained by gender gap detected in groups of gifted teenagers: boys are more prevalent among gifted in math, while there are more girls among gifted in humanities. Pairwise comparison of means suggest that gender is important factor for most of the wellbeing components, and type of giftedness plays lesser role.

Gender factor was important for autonomy, which was higher in boys than in girls. Boys are more likely to stand their ground against social pressure, are independent, in control their behavior and estimate themselves on the basis of personal standards. Girls are more subjected to social pressure, anxious to expectations from others and consider opinions of others when making decisions. Boys also have higher levels of environmental mastery than girls. Girls on the other hand have higher personal growth estimates. In both cases, contrasts between boys and girls were the most evident in the group of gifted in sports. The same trend was also revealed for Purpose in life scale, where girls gifted in sports had higher scores than boys.

Having common profile of associations between wellbeing components and gender, we can suggest that the process of assimilation of gender norms unfolding in adolescence might explain this links. However, we must note that the contrast differences were associated with specifics of activity connected to the respondent's gift.

Boys and girls are noted distinction on autonomy in the group of gifted in humanities. Those respondents are typically characterized by deeper reflection about life and sensitivity to social relations [30]. Advanced potential in humanities reinforces age-specific process. The same reinforcement of age-related trend is found among gifted in math. Girls from this sample exceed boys in ability to build more satisfying relations characterized by closer and emotionally rich connections with other people. Adolescents gifted in math typically struggle along close interpersonal relationships [29] unlike other groups of gifted.

Type of giftedness was relevant for purpose in life scale. Gifted in humanities and gifted in sports tend to have a strong sense of meaning and goal orientation, while adolescents gifted in math usually experience loss of direction and meaninglessness. Among gifted in sports, girls have much higher estimates of goal orientation than boys. We could suggest that life perspectives might be influenced by their achievements. For physiological reasons, girls achieve high results in sports earlier than boys. By late adolescence they clearly understand their potential and have a plan for proper implementation of their talents. This also might explain gender difference among gifted in sports in personal growth and environmental mastery: in late adolescence girls are forced to solve harder tasks than boys. For gifted in humanities, gender difference in personal growth and environmental mastery might be due to challenging educational program, aimed at admission into restricted number of top university-level programs. For gifted in math, future stay partially vogue because of the large number of prospects available for choice, all staying in high demand for the society and at the same time making use of their advanced analytical skills.

There were no main effects of gender and type of giftedness for self-acceptance, but the interaction was significant. Higher estimates of self-acceptance are detected in «opposite gender specific» fields (math for girls, and humanities for boys). This might be explained by the importance of self-acceptance in relations with opposite sex, which might reduce potential negative effects of involvement in «gender atypical» activities.

To answer the first study question we might argue that there are no differences in general wellbeing scores among adolescents gifted in different fields: math, humanities and sports. Separate components of psychological wellbeing, such as purpose in life and self-acceptance, are influenced by activity connected to the talent. To answer the second study question, we would conclude that gender differences are subjected to age-specific trends of personal development in adolescence and are not specifically linked to type of giftedness. Type of giftedness might reinforce these trends, making them evident and easy to notice.

Our study has certain limitations. The first limitation is closely related to the criteria for identifying gifted adolescents. In our case, that was a competitive admission into educational programs, specific to a person's gift. Such admission relies on the procedure, method and expertise of the judges. Also, not all admitted children are equally successful in their talents. Some respondents already have well acknowledged achievements, such as medals from international competitions; others find it difficult to finish the program. The second limitation of our study is that all teenagers are educated in specific types of educational institutions, in special environment and among peers who are similar to them. Considering the big fish little pond effect described by H. Marsh and J. Parker, perception of self and personal achievements is based on comparison with peers [38], so a gifted teenager feels that he/she achieved more in his/her life compared to other general-ability children but not to his/her gifted peers. Thus, the results obtained in this study cannot be generalized into the samples of gifted teenagers educated in general-type secondary schools without further empirical proof. Imbalance in samples explained by particularities of the education and a limit in numbers admitted into educational programs allows to make only rough estimates of gender specifics and age dynamics of wellbeing in gifted adolescents. Our data demonstrates the importance of including type of giftedness and gender into the studies of wellbeing of gifted teenagers.

5. Conclusions

Psychological wellbeing is essential for personal and professional fulfillment of gifted adolescents, and the studies of psychological wellbeing are highly demanded by both science and practice. The results of reported studies on wellbeing and giftedness are inconsistent, and discussions stay open for several ages. Theoretical analysis suggests that psychological wellbeing of gifted adolescents might be subjected to the type of giftedness, gender, and age. Our results suggest that gender and type of giftedness play important role not for general wellbeing but for separate wellbeing components. Gender, age and type of giftedness must be attended when studying psychological wellbeing of gifted adolescents.

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