Empirical Typology of the Realization of the personal Potential of gifted Adolescent Children

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Abstract:

The article presents the results of a cluster analysis of data. The results of the study are based on the following 5 psychodiagnostic methods: "Identification of personal resources" by N. Vodopyanova and M. Shtein; "Indicator of coping strategies" by D. Amirkhan; "Motivation for success and fear of failure" by Rean; the author's questionnaire "Identification of motivation to study"; and "Self-actualization test" by E. Shostrom. The analysis of the results was carried out based on the number of observations in each cluster, the chronology of interactions, and the differential variations between the initial and final centers of the clusters. The first typological

group included 660 subjects, and the second had 109 subjects. The typology based on the object of the researched problem is substantiated, namely: motivated-realization and unmotivated-realization types of the personal potential of gifted youth according to appropriate scales.

Introduction

The topic of self-realization remains highly relevant today, and our research uniquely focuses on exploring this issue from a motivational perspective in gifted boys and girls, which represents the novelty of our study.

The purpose of our study is to empirically investigate the typology of personal potential realization of gifted children of adolescent age based on a number of developed or undeveloped motivational tendencies.

Research hypothesis: The typology of the personal potential realization of gifted youth will depend on the justification of the research sample, the revealed number of clusters, and differential differences in the initial and final centers of clustering.

Research methods

The empirical validation of the typological characteristics of personal potential realization in gifted individuals is an unresolved issue.

In previous publications, we used theoretical methods to theoretically substantiate the problem of the typology of the personal potential realization of gifted children of adolescent age, including analysis of the used literary sources, systematization, and classification. To determine the types of personal potential realization, we selected the following psychodiagnostic methods: "Definition of personal resources" by N. Vodopyanova and M. Shtein; "Indicator of coping strategies" by D. Amirkhan; "Motivation of success and fear of failure" by Rean; the author's questionnaire, "Identification motivation to study"; and "Self-actualization test" by E. Shostrom (Sadova M.A., 2022).

In our study, we present empirical findings based on a cluster analysis of data related to the research problem. This statistical method allowed us to classify participants into two contrasting groups (personality types). These groups were named in accordance with the identified clusters, ensuring that the defined scales and statistical outcomes accurately reflect the study's results.

Table 1 presents the results of the data analysis of the observations included in each of the selected clusters.

Table 1 Number of observations in each cluster

Cluster	1	660.000
	2	109.000
are valid		769.000
missed		0.000

Based on the distribution of **769 subjects**, 2 clusters (2 groups of subjects) were determined by cluster typology. **The first group included 660 subjects, and the second had 109 subjects.** The number of missed indicators and valid indicators is 769.

Table 2 Chronology of interactions

Iteration	Changes in cluster centers	
	1	2
1	0.511	23.263
2	0.000	0.000

Convergence is achieved with little or no change in cluster centers. The maximum change in the absolute coordinate of any center was 0.000. The current iteration is 2. The minimum distance between initial centers is 71.399.

Changes in the centers of clusters correspond to the normal distribution of the subjects under the determined scales of the questionnaire tests.

Research results

Taking into account the fact that we consider motivational aspects as the realization of personal potential, it is appropriate to name the corre-

sponding types as follows: motivated-realization and unmotivated-realization types of personal potential.

At the theoretical level, we substantiate the types of personal potential realization of gifted young men and women based on the following scales: Motive of satisfaction, Motive of professional realization, Social motive, Identification of external positive motives, Identification of external negative motives, Identification of the social significance of the pupil (student), Identification of prestige motivation, Disciplines by profession, Literature, Language (linguistics), Creative disciplines, Time Orientation Scale, Support Scale, Value Orientation Scale, Behavior Flexibility Scale, Sensitivity Scale, Spontaneity Scale, Self-Esteem Scale, Self-Acceptance Scale, Perceptions of Human Nature Scale, Synergy Scale, Scale Acceptance of Aggression, Contact Scale, Cognitive Needs Scale, Creativity Scale, Problem Solving Scale, Social Support Scale, Problem Avoidance Scale, Failure Motivation, Success Motivation Scale, and Resources.

We used a parallel method to compare the initial and final centers of clustering according to each of the scales proposed above. In the second stage, we compare the results of the first and second cluster studies in parallel.

Table 3 shows the statistical indicators of the initial and final centers according to the two detected clusters.

The initial and final centers of the clusters provide an opportunity to see, according to each of the selected scales, at which stage the motivation of the personal and realization potential the gifted youth will be more vividly expressed.

The Motive satisfaction scale is characterized by both the expressed intra- and extrinsic motivation to the general activity. The difference according to this scale falls only on the final centers of the clusters, which increase the indicators (0.00 - 2.48).

The Motivation for Professional Realization scale is aimed at the active and correct choice of profession in youth. These indicators increase at the initial centers of clusters (1.00 - 2.79). Such results are characterized by the fact that gifted children in high school can happily choose a profession.

The Social motive scale increases in the initial centers of the clusters and decreases later on in its dynamics (2.00 - 0.56). Such data are characterized by the fact that it is very important for first-year students to adapt to new educational institutions.

The scale Identification of external positive motives is aimed at extrinsic motivation, which depends on the external approval of the student and the evaluation of their completed tasks at the appropriate level. It manifested itself more clearly in the initial clusters (4.07 - 1.01).

The scale Detection of external negative motives manifested itself more in the initial clusters (3.00 - 2.54). An example of such motivation can be a demonstrative manifestation of one's individuality (where peers, especially teenagers, begin to ridicule and show disrespect and contempt for others).

Identification of the social significance of the pupil (student) is a scale that manifested itself more vividly between clusters than between the initial and final centers (0.79; 2.91 – 1.30; 2.40). Such results testify not to the dynamics of the motivational process, but to the motivational typology, which we laid down experimentally in the study.

With Identification of prestige motivation, the scale at the initial level (12.54 - 13.00) was more clearly revealed. After all, this scale is related to the choice of a profession, particularly as it relates to socio-cultural factors.

Disciplines by profession is the scale for those subjects who study a relevant specialty that they like (12.54 - 13.00), and this clearly displayed itself.

Literature as a choice of profession was more evident in elementary schools (8.00 - 7.21).

For Language (linguistics), the centers differ with a very wide gap, and the final one showed itself the most (18.39 - 9.00). For example, for admission to master's or doctoral studies, in addition to specialization, students must pass a foreign language exam.

Creative disciplines showed themselves more according to the scale at primary centers (22.14 -24.00).

The Orientation in time scale measures a person's ability to combine, accept the past/present/

Table3 Statistical indicators of initial and final centers by clusters

End centers of clusters			Initial centers of clusters		
	Cluster			Cluster	
	1	2		1	2
Pleasure motive	0.00	2.48	Pleasure motive	0.00	0.00
Motive of professional implementation	1.00	2.79	Motive of professional implementation	1.00	1.00
Social motive	0.00	0.56	Social motive	0.00	2.00
Identification of external positive motives	1.00	1.00	Identification of external positive motives	1.00	4.07
Identification of external negative motives	9.00	2.54	Identification of external negative motives	9.00	3.00
Identification of the social significance of the pupil (student)	0.79	2.91	Identification of the social significance of the pupil (student)	1.30	2.40
Identifying prestige motivation	9.00	12.54	Identifying prestige motivation	9.00	13.00
Disciplines by profession	9.00	12.54	Disciplines by profession	9.00	13.00
Literature	7.00	7.21	Literature	7.00	8.00
Language (linguistics)	42.00	18.39	Language (linguistics)	42.00	9.00
Creative disciplines	54.00	22.14	Creative disciplines	54.00	24.00
Orientation in time scale	6.00	25.67	Orientation in time scale	6.00	6.00
Scale of Support	4.00	5.68	Scale of Support	4.00	6.00
Scale of value orientations	9.00	11.15	of value orientations	9.00	13.00
Behavior flexibility scale	6.00	8.90	Behavior flexibility scale	6.00	6.00
Sensitivity scale	8.00	6.00	Sensitivity scale	8.00	8.34
Spontaneity scale	3.00	5.00	Spontaneity scale	3.00	3.89
Self-esteem scale	4.00	4.95	Self-esteem scale	4.00	2.00
Self-acceptance scale	7.00	13.00	Self-acceptance scale	7.00	9.71
Scale of Ideas about human nature	10.00	11.35	Scale of Ideas about human nature	10.00	12.00
Scale of Synergy	7.00	8.00	Scale of Synergy	7.00	7.49
Acceptance of aggression scale	5.00	6.78	Acceptance of aggression scale	5.00	6.00
Contact scale	9.00	15.00	Contact scale	9.00	12.80
Cognitive needs scale	42.00	48.30	Cognitive needs scale	42.00	45.00
Creativity scale	5.00	7.33	Creativity scale	5.00	8.00
Problem Solving scale	0.00	3.58	Problem Solving scale	0.00	0.00
Scale of Social Support	0.00	0.00	Scale of Social Support	0.00	1.61
Problem Avoidance scale	0.00	0.00	Problem Avoidance scale	0.00	0.39
Motivation to fail	0.00	0.00	Motivation to fail	0.00	0.32
Motivation to succeed scale	0.00	0.71	Motivation to succeed scale	0.00	3.00
Resource	0.00	2.00	Resource	0.00	0.99

future, and understand that all these time dimensions are an integral part of a person's life. This showed itself very brightly at the final stage (25.67 - 6.00).

The scale of Support of family, relatives, and friends showed itself more at the initial level of admission to higher education (5.68 - 6.00). After finishing school, children are not used to living independently and making important strategic decisions about their lives, so the scale is considered much more relevant at the age of 16-17, in contrast to the older student audience.

The scale of Value Orientations was also more pronounced at the initial level if we take into account value orientations in professional self-determination and the formation of a gifted personality (11.15 - 13.00).

The Flexibility of Behavior scale showed itself more in the final center than in the initial one (8.90 - 6.00). The results indicate that gifted children, when placed in unfamiliar conditions, can demonstrate flexibility in adapting to unpredictability; however, this adaptation often comes at a cost, as it initially triggers maladjustment. Nevertheless, after a period of adjustment, they tend to recover more quickly and navigate challenging situations more effectively.

The Sensitivity scale manifested itself more at the initial center (8.34 - 6.00). The results show that gifted participants in the educational process, if they don't know the group in which they are studying, are more anxious to make an impression, show their strengths, to prove themselves to be at a decent level.

The Spontaneity scale at the initial level showed itself less, in contrast to the final one (5.00 - 3.89). The corresponding scale describes quick decision-making without additional thinking. The subjects who were older and those who belonged to the category of creatively gifted could express themselves more freely, casually, and unpredictably.

The Self-Esteem scale also increases according to indicators in the final centers of significance, in contrast to the initial ones (4.95 - 2.00). We argue this result is because a person respects themselves more in adulthood due to the results of their activity (educational, professional, and creative).

The Self-acceptance scale manifests itself more in the final center in contrast to the initial one (13.00 - 9.71). It is logical that as self-esteem increases during the youth of gifted students—compared to their adolescent counterparts—the self-perception scale reflecting their potential for creative or academic abilities follows a similar distribution.

The Synergy scale reflects the ability to integrate physical and spiritual dimensions, balance academic learning with creativity, and harmonize recreation with productivity—particularly relevant for gifted student youth. According to the cluster analysis, this ability is more strongly expressed in the final clusters compared to the initial ones (8.00 - 7.49).

According to E. Shostrom, the Acceptance of Aggression scale indicates the extent to which a gifted personality understands that aggression can manifest itself in a positive direction, as opposed to a negative one. In order to reveal and realize personal potential, you need to overcome psychological barriers by setting goals. In the final centers, the results are higher compared to the initial ones (6.78 - 6.00).

The scale of Contactness describes the degree of entry of a gifted personality into the social environment, namely to what extent the person can find and approach to others. It manifested itself more in the final centers, in contrast to the initial ones (15.00 - 12.80)

The scale of Cognitive Needs showed itself with very high indicators (48.30 - 45.00). Such results may indicate that the largest number of subjects were academically gifted (grade certificates) as opposed to intellectually or creatively gifted.

The Creativity scale indicates the level of performance of assigned tasks in non-traditional ways. This scale describes the creative component of a gifted participant in the educational process, which is revealed through divergent thinking (several options for solving a task). It manifested itself more in the initial clusters (7.33 - 8.00).

The Social Support scale showed itself more in primary centers because teenagers and first-year students really need it from relatives and friends, especially when they are not yet used to a new social environment (0.00 - 1.61).

The scale Motivation to Succeed manifested itself better compared to the previous scale and was revealed more successfully in the final centers compared to the initial ones (3.00 - 0.71). Motivation for success increases when a gifted person sees the results of their activities (learning, creativity).

The Resource scale in gifted students increased from the initial to the final centers (2.00 - 0.99), which indicates activity and motivation in educational and professional activities.

Now we will briefly justify the typology we defined in practice.

Cluster 1 - The unmotivated-implementation type of personal potential of a gifted person is characterized by significantly lower indicators in motivational trends in contrast to the motivated-implementation type. According to the relevant indicators, this type indicates a very low level on 11 scales: Motive of satisfaction (0.00), Social motive (0.00), Motive of professional fulfillment (1.00), Detection of external positive motives (1.00), Detection of social significance of the pupil (student) (0.79), Solving problems (0.00), Social support (0.00), Avoiding problems (0.00), Motivation for failure (0.00), Motivation for success (0 .00), and Internal resources (0.00).

The following 16 scales were found to be at the average level: Detection of external negative motives (9.00), Detection of prestige motivation (9.00), Disciplines by profession (9.00), Literature (7.00), Support (4.00), Value orientations (9.00), Flexibility of behavior (6.00), Sensitivity (8.00), Spontaneity (3.00), Self-esteem (4.00), Synergy (7.00), Acceptance of aggression (5.00) , Contact (9.00), Creativity (5.00), Time Orientation (6.00) and Self-Acceptance (7.00).

Only 4 scales worked at a high level: Concepts of human nature (10.00), Language (42.00), Creative disciplines (54.00), and Cognitive needs (42).

Cluster 2 - The motivated-realization type of a gifted person's personal potential has significantly higher indicators compared to the previous type.

Low scores were found on only 2 scales: Avoidance of problems (0.00) and Motivation to fail (0.00). Such scales only confirm the motivated-realization type because high indicators of the corresponding scales indicate the opposite - a low level of motivation.

Medium-high indicators were found on 20 scales: Motive of satisfaction (2.48), Social motive (2.00), Motive of professional realization (2.79), Identification of external positive motives (4.07), Identification of the social significance of the student (2.91), Solving problems (3.57), Social support (1.61), Motivation for success (3.00), Resources (2.00), Identifying external negative motives (3.00), Literature (8.00), Support (6.00), Flexibility of behavior (8.90), Sensitivities (8.34), Spontaneity (5.00), Self-esteem (4.95), Synergies (8.00), Acceptance aggression (6.78), Creativity (8.00), and Problem Solving (3.58).

10 scales worked at a high level: Identification of prestige motivation (13.00), Disciplines by profession (13.00), Value orientations (13.00), Self-acceptance scale (13.00), Scale of ideas about human nature (12.00), Contact (15.00), Orientation in time (25.67), Language (linguistics) (18,39), Creative disciplines (24), and Scale of Cognitive Needs (48).

Comparing the results of the first and second clusters, we see significant differences in motivational trends regarding the personal potential of gifted youth. A significantly larger number of scales increased in the motivated cluster at high and medium-high levels, in contrast to the unmotivated one. Also, a large number of scales dominate the unmotivated type in relation to the low level of motivation of gifted adolescent youth.

Discussion

An empirical typology of the personal potential realization of gifted youth has not been studied by scientists.

The relevant research problem is included in the list of topics of the Institute of the Gifted Child of the National Pedagogical Academy of Ukraine and the international grant of experimental developments of the Faculty of Psychology of the Pan-European University (M.A. Sadova, 2022).

The problem of implementation potential has its origins in the humanistic direction of psychology. In particular, the following foreign scientists made significant contributions to development and self-realization: Katelein Barbier,

Vincent Donche, Karin Verschueren (7), Weihua Fan, Cathy Williams (12), and others.

Aspects of the motivational structure and typology of the personal potential of gifted youth have become debatable issues in the scientific works of Sadova M., both at the theoretical (Sadova M.A., 2023) and empirical levels (Sadova M.A., 2022).

At this stage, the problem was substantiated by reviewing and analyzing foreign studies from the past 5 to 8 years that explore motivational aspects within the structure of personal potential in gifted adolescents (Mann, R. V., 2020). For the corresponding problem, we relied on the research of foreign scientists and organizations. Over the past decade, modern foreign scientists have considered the factors and components of motivation in the structure of the personal potential of gifted youth (Worrell F. C. et al., 2012). In studies by I. V. Samokhin, M. G. Sergeeva, E. V. Tabuyeva, T. G. Stanchulyak, E. G. Kolesina (Samokhin I. at al., 2018), and I. L. Yakymova. (Yakymova I.L., 2021), the essence of the components of extra- and intrapunitive motivation, which lead to the disclosure of the personal potential of gifted children of adolescent age, is described (1). The works of Sternberg R. (Sternberg R., 2016), Vorel F. K., Sharko Y. E., and Gabelko N. Kh. (Worrell F. C. et al., 2012) highlight the study of the positive and negative attribution of success and failure of gifted people (Sternberg R., 2016). Danchenko O. B., Palchynska M. V., Ajaman I. A., and Telychko N. A. (Danchenko O. B. at al., 2020) investigated the failure of gifted children from low-income families (Ellen D. Fiedler, 1999).

Conclusions

Summarizing the above, it is worth noting that motivation is a dynamic process of realizing the personal potential of gifted youth.

The results of the cluster analysis is based on the number of observations within each cluster, the chronology of interactions, and the differential variations between the initial and final centers of the clusters. The empirically derived typology related to the core issue identifies two types of personal potential realization in gifted youth—motivated-realization and unmotivated-realization—based on the relevant assessment scales. In particular, according to the motivated-realization type, 10 scales worked at a high level: Identification of prestige motivation (13.00), Disciplines by profession (13.00), Value orientations (13.00), Self-acceptance scale (13.00), Perceptions of human nature (12.00), Contact (15.00), Orientation in time (25.67), Language (linguistics) (18.39), Creative disciplines (24), and Scale of cognitive needs (48). According to the motivated-non-fulfillment type, 11 scales worked at a very low level: Motive of satisfaction (0.00), Social motive (0.00), Motive of professional realization (1.00), Identification of external positive motives (1.00), Identification of social significance of the pupil (student) (0.79), Solving problems (0.00), Social support (0.00), Avoiding problems (0.00), Motivation for failure (0.00), Motivation for success (0. 00), and Internal resources (0.00).

Therefore, according to typological trends, the types of motivational formations play an important role for youth when choosing a profession, forming a personality, and realizing gifted youth in various spheres of activity.

Future research should focus on developing the motivational structures of gifted individuals, as only 109 out of the 769 participants studied demonstrated motivation.

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