

**SCTMG 2020****International Scientific Conference «Social and Cultural Transformations in the  
Context of Modern Globalism»****AWARENESS, ORIENTATION AND JUSTIFICATION AS  
INDICATORS OF PROFESSIONAL DETERMINACY OF HIGH  
SCHOOLERS**

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***Abstract***

The article describes the technology and results of the analysis of professional determinacy of high schoolers of Belgorod and Belgorod region. Neither theoretical nor empirical studies provide indicators to assess the professional orientation of schoolchildren and correlate data from various studies. Therefore, authors usually pay attention to various indicators that characterize the professional choice. The professional determinacy of high schoolers was assessed using three indicators: awareness, orientation and validity of a professional choice. Attention is paid to the operationalization of these indicators and their assessment based on a survey of ninth-, tenth- and eleventh-graders. The survey showed that there are 6 types of professional choices, each of which is split into 2–8 options, depending on the correlation of respondents' awareness of professional needs and their ability to master different professions. The technology of career guidance should be of differentiated nature, specific for each option of the professional determinacy of optants. There are three levels of organization according to the degree of complexity of the work being done: a) easy (corrective) – for unambiguously determined students; b) average (contributing) – for ambiguously determined students; c) difficult – full-scale career guidance for undecided schoolchildren.

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**Keywords:** Professional choice, professional needs, professional opportunities, option situation.



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## 1. Introduction

One of the important social problems is the career guidance for young people. Technologies of career guidance are being developed for schoolchildren and adults, disadvantaged groups of the population, and the unemployed (Career Guidance, 2004).

For Russia, the state of education is an issue of national security. Only by solving these problems, including the problem of uncertainty of the professional choice of students, can the country survive as a subject of world politics and begin innovative development within the sixth technological structure (Tavokin, 2016).

It is obvious that the uncertainty of the professional choice is an obstacle to the professional development of the individual.

Due to challenges posed by modern development, a significant number of empirical studies analyze this issue in the context of transformations of various spheres of public life (Konstantinovsky & Popova, 2015).

At the same time, there is no holistic concept in the organization of career guidance work, coordinated efforts of social institutions, forecasting and labor market planning (Selivanova, 2017).

The urgency of the problem of growing professional uncertainty in high schoolers is caused by a number of factors that are both exogenous and endogenous.

The following circumstances can be attributed to exogenous factors.

The tradition when people became specialists in a certain field and did not change it all their lives, continuously accumulating professional capital. University graduates get a job which they can get paying little attention to their profession. Employers are often not interested in the human capital of their employees (Tavokin, 2016; Tihonova & Karavay, 2018).

The lack of a clear economic and staffing policy causes many negative consequences: in particular, the randomness of professional preferences of adolescents, their weak compliance with current and future needs of society (Selivanova, 2017). Unsatisfied demand for labor is growing on the labor market, and the number of unnecessary specialists is increasing (Tavokin, 2016). There appear various forms of additional professional education, retraining and advanced training courses.

The lack of balance between the market of educational services and the labor market is one more exogenous factor. The demand of the labor market is not met by the market of educational services: universities build their work on the basis of the demand of schoolchildren and their usual areas of training (Denisova-Schmidt & Leontieva, 2015; Dezhina & Klyucharyov, 2018; Klyucharyov, 2015; Konstantinovsky & Popova, 2015; Veretennikova, 2009).

The crisis that Russia is experiencing has exacerbated the problem of youth's non-competitiveness in the labor market. According to the Superjob portal (October 21, 2015), in Russia the total number of unemployed applicants aged under 25 increased by 11 %, aged under 30 years – by 7 %. According to the data of W-City.net polls, the youth turnover is over 45 % (Tavokin, 2016).

Among the endogenous factors that impede the optimal professional choice, the following can be mentioned.

1) gradual transition of the value of labor from a terminal status to an instrumental one. This increased attention to its external attributes: wages, prestige, and career advancement, which could not but

affect the nature of motivation when young people choose their professional path. The dominance of the ideals of a consumer society, the desire for success without much effort have contributed to it.

2) schoolchildren do not see the difference between the relevance and importance of professions, between their personal and social relevance. This introduces additional confusion into the complex process of choosing a profession, mixing these four indicators into a tangle of poorly recognized criteria.

3) the state of uncertainty of professional choice is caused by the mismatch of professional needs and opportunities, their poor development and shallow awareness of their optant (i.e., the subject making the choice).

4) the problem of choosing a professional and life path arises when a person cannot be aware of all life choices related to work, family, social advancement, material well-being, and spiritual development (Mikhaleva, 2015). This age is characterized by the absence of life plans, skills, value-semantic uncertainty.

5) due to their age, infantility and lack of appropriate training, most schoolchildren are not able to set goals and solve problems. They have not yet gained experience in finding alternatives, making choices and decisions in difficult life situations. Therefore, along with upbringing and training, it is necessary to update personality of students, which involves the development of appropriate creative competencies.

## 2. Problem Statement

Currently, there are a lot of theories on professional determinacy of youth: Among theories developed by Charlotte Buhler, Eli Ginsberg, James Marsha, Frank Parsons, Donald Super and other scientists (Fukuyama, 1989). The authors pay attention to its description, highlight its stages and mechanisms. However, neither theoretical nor empirical studies identified indicators that make it possible to assess the professional orientation of schoolchildren and correlate data from various studies. The authors usually pay attention to various indicators that characterize the professional choice.

Meanwhile, it seems that the state of professional determinacy (PD) can be characterized by the PD index which assesses the degree of development of optant's ideas about his future profession, readiness to master this profession and work within it. It can identify both the PD of an individual and a social group. It is a function of several indicators: awareness (A), orientation (O) and justification (J) of the professional choice which are correlated with specific properties of optants (gender and age differences, status of parental families, place of residence, etc.):

$$PD = F(A \cap O \cap J)$$

These indicators are characterized by other indicators. In particular, awareness of the professional choice consists of: a) articulation of personal and social significance and the relevance of the profession; b) apperceptivity of personal and social professional needs and opportunities; c) relevance of these four dispositions of the situation of options. The need for assessment is caused by the desire to answer the questions: Is it the "right" choice? Is the optant aware of this? How can you evaluate its "correctness"?

Articulation characterizes the degree of understanding of the significance (value) and demand (availability of demand) of the profession by the optician. Modern educational standards establish a competence to understand the social significance of profession.

The optant must be sure of full apperception of professional needs and opportunities. He must understand what he really wants. What abilities does he have? What professions are in demand on the labor market and which of them can he master in educational institutions? Apperctivity is understood as a depth of perception and recognition of one's professional needs and opportunities, as well as professional needs and opportunities of a society.

Having understood personal and social needs and opportunities, the optant can begin to sort out the options correlating each of them with appropriated needs and opportunities. In accordance with the four-positional concept of a professional choice, the main criterion for its optimality should be conformity of professional needs (I want) and professional abilities (I can), as well as professional needs (needed) and possibilities (possible) of society. A measure of this correspondence is called the relevance of professional choice (Fomin et al., 2015a).

Professional orientation includes indicators of orientation and significance.

The orientation characterizes the profession that the individual or group optant considers attractive. The choice of one or several professions characterizes an individual orientation, serves as an individual indicator. As a group indicator characterizing the orientation of optants, the range of professions preferred by students of certain age and gender is used.

The significance of the professional choice serves as an individual indicator characterizing the decision of an optant. Students often choose several professions or cannot choose even one profession. The choice may be unambiguous, ambiguous, or absent (be 0-digit).

A group indicator of the significance of the choice is its volatility, which provides a complete picture of the distribution of various types of significance for a group of optants.

The third indicator that reveals the specifics of professional certainty is the validity of professional choice, which implies that the optants understand motives-causes and motives-criteria, in accordance with which they make their choices. Motives can be informative, social, pragmatic, etc.

The article aims to provide a brief summary of the technology and results of self-assessment of professional certainty by tenth and eleventh graders. The article aims to specify the procedure and assessment results for the awareness of professional needs and abilities.

### **3. Research Questions**

The article deals with the operationalization of the main indicators characterizing professional certainty of schoolchildren. Particular attention is paid to the assessment of awareness of their professional choice. The difference in self-esteem indicators in female and male tenth and eleventh graders is studied.

### **4. Purpose of the Study**

The article aims to develop a set of indicators to conduct a focused study of the state of professional orientation of high school students. Using the indicators, it is necessary to assess professional certainty of students.

## 5. Research Methods

The study of professional certainty of high school students was conducted at the theoretical and empirical levels. In the first case, the actualization-potential approach to the professional development was justified. The model and main provisions of this approach are described in a number of works (Fomin et al., 2015a; Fomin et al., 2015b).

In the second case, in 2009 and 2014, pilot empirical studies were conducted in school No. 1 in Stroitel (Belgorod Region). A questionnaire for all students, including tenth and eleventh graders was used. In total, in 2009, 74 senior students were surveyed (35 boys and 39 girls) to establish the initial state of professional orientation (including 44 eleventh- and 30 tenth graders). In 2014, 88 people were surveyed to establish the results of a five-year experiment aimed at improving the technology of career guidance. (45 boys and 43 girls), including 40 eleventh- and 48 tenth graders.

Later, a questionnaire survey of 418 senior schoolers from 9 schools of Belgorod was conducted. The total number of students was 3263 (1564 tenth graders, 1699 eleventh graders). The sample included 222 people from tenth grades (96 boys, 126 girls) and 196 people from eleventh grades (95 boys, 101 girls), which ensured its representativeness. The next sample which involved the selection of several schools from their total number was used. To determine the schools participating in the survey, the draw method was used.

The main tool was a questionnaire consisting of several blocks of questions. The questions of the first block were aimed at self-assessment of aptitude and relevance of professional needs and opportunities. The questions of the second block were designed to specify the role of various channels of influence on the professional choice. The questions of the third block were aimed to identify the validity of the choice made. The fourth block concerned questions about the self-esteem of awareness, including articulation. The results were published in various articles, including "Experience in developing a comprehensive technology for vocational guidance of students" (2014).

## 6. Findings

Summarizing the results obtained, the following assessments of professional choice indicators can be made.

Awareness was determined by three indicators: articulation, aptitude and relevance.

The articulation of social and personal significance and relevance of the profession was evaluated by the following indicators.

Personal significance was assessed by the percentage of answers "This profession is important for me, I like it" (72.6 %). Personal demand was assessed by the percentage of answers "I have professional abilities" (73.1 %). It is typical that the answer "The demand for a profession is not important" was given by 12.8 % of respondents. These indicators scored a fairly close number of votes, which may indicate that schoolchildren choose a profession which they like.

Social significance was assessed by the percentage of answers "I value the social significance of the profession, its prestige" (15.0 %). Public demand was estimated by the proportion of different answers. The answer "I have examples of people successfully working within this profession" (49.8 %)

was the most preferable. The minimum number of respondents preferred the answer “The demand for this profession is determined by the economic policy of the government” (8.3 %). At the same time, 5.2 % said they were not familiar with the demand for this profession. 1.4 % of the respondents found it difficult to answer.

Obviously, it is difficult for schoolchildren to articulate the last two indicators due to their poor knowledge of public life and the labor market.

The results of the study conducted by scientists of the Institute of Sociology of the Russian Academy of Sciences show that schoolchildren often lack ideas about the future profession, and the share of those who are completely confident in the correctness of their choice is 67.9 %, the share of those who are not completely sure is 27.2 %, and the share of those who are not confident is 4.9 % (Konstantinovskiy & Popova, 2015). Our data are in agreement with the data obtained by these scientists, although they were obtained for different target audiences.

However, it was difficult for high school students' to assess apperceptivity and relevance of their professional choice. They were asked the following questions: “What type of profession is the most attractive to you?” “What kind of profession do you have abilities for?”. The answer to the first question shows the respondents' awareness of their professional needs, and the answer to the second shows possibilities for their development. The needs of the individual were indicated by the disposition "I want" (X), the possibilities – by the disposition "I can" (M). Two other dispositions that characterize options (choices) were evaluated: “Necessary” (N) and “Possible” (P), which identified professional needs and possibilities of society. According to some studies (Fomin et al., 2015b), the mutual correspondence of these four dispositions indicates optimality of the professional choice of the optant. The data obtained are summarized in Table 1.

**Table 01.** Options for the professional choice of high school students

Determinacy indicators	X grade		XI grade		Σ	%
	Girls	Boys	Girls	Boys		
1. Unambiguous choice						
1.1. Variants of an unambiguous possible choice						
a) X = 1; M = 1 (1)	15	29	15	17	76	13,1
б) X = 1; M = n (1)	4	4	6	5	19	3,3
Total	19	33	21	22	95	16,4
1.2. Variants of an unambiguous impossible choice						
a) X = 1; M = 1 (0)	9	12	2	8	31	5,4
б) X = 1; M = n (0)	1	0	1	1	3	0,5
в) X = 1; M = 0	1	0	1	1	3	0,5
г) X = 1; M = M <sub>0</sub>	0	0	2	0	2	0,3
Total	11	12	6	10	39	6,7
2. Multi-choice						
2.1. Variants of a possible multichoice						
a) X = r; M = 1 (1)	17	14	13	8	52	9,0
б) X = r; M = n (1)	14	4	9	4	31	5,3
в) X = r; M = r (1)	3	6	5	7	21	3,7
г) X = r; M = n (s)	10	3	6	6	25	4,3
д) X = r; M = n (n); r > n	36	16	32	24	108	18,6
е) X = r; M = n (r); r < n	17	12	15	18	62	10,8

ж) $X = r; M = r(r); r = n$	18	21	21	26	86	14,8
з) $X = r; M = r(n)$	6	4	5	2	17	2,9
Total	121	80	106	95	402	69,4
2.2. Variants of an impossible multichoice						
а) $X = r; M = 1(0)$	3	1	3	2	9	1,6
б) $X = r; M = n(0)$	2	5	2	1	10	1,8
в) $X = r; M = M_0$	2	0	4	0	6	1,0
г) $X = r; M = M_0 + n$	1	0	1	0	2	0,3
Total	8	6	10	3	27	4,7
3. Zero choice						
3.1. Variants of a zero possible choice						
а) $X = X_0; M = n$	2	2	0	0	4	0,7
б) $X = X_0 + r; M = n(n)$	1	1	1	2	5	0,9
Total	3	3	1	2	9	1,6
3.2. Variants of a zero impossible choice						
а) $X = X_0; M = M_0$	0	1	0	3	4	0,7
б) $X = X_0 + r; M = M_0$	0	0	1	0	1	0,2
в) $X = X_0 + r; M = M_0 + n$	1	1	0	0	2	0,3
Total	1	2	1	3	7	1,2
Number of respondents	163	136	145	135	579	100

The following notation is used in the first column of the table:  $X$  – the number of choices of the desired type of profession (I want),  $M$  – the number of types of professions for which the optant has abilities (I can). They can have different values ( $X = r$ ) or ( $M = n$ ), including being equal to 0 or 1. The number in brackets ( $\eta$ ) means the size of the area of intersection of  $X$  and  $M$ , i.e. shows the number of desired types of professions, coinciding with the number of possible ones. It can be equal to the number of needful choices ( $\eta = r$ ), the number of possible choices ( $\eta = n$ ), indicate the absence of intersections ( $\eta = 0$ ), or signal a single general match ( $\eta = 1$ ). The situation ( $\eta = s$ ) means that between  $X$  and  $M$  there is a number of intersections equal to neither  $r$  nor  $n$ . Obviously, in all cases  $r \geq s$  and  $n \geq s$ .  $X_0$  and  $M_0$  – mean the number of answers “Not yet decided” with needs ( $X$ ) and abilities ( $M$ ), respectively.

A detailed analysis of the respondents' answers made it possible to single out a number of different options for professional choice, which reflect a rich palette of representations of high school students about their professional needs and abilities.

The share of the unambiguous options is 23.1 %. Moreover, it is somewhat more characteristic of boys (57.5 %) than girls (42.5 %).

Two groups of options can be distinguished: unambiguously possible and unambiguously impossible types. In the first case, this refers to the choice of a profession for which the optant has abilities; in the second case, the choice of a profession is not possible.

There are two options for an unambiguously possible choice.

Option 1.1.a is the unambiguous choice: the only need (I want) corresponds to the only possibility (I can). This is an ideal case inherent in purposeful individuals who do not need to be promoted.

Option 1.1.b is the unambiguous opportunity-excess choice. Optants, choosing one type of profession, feel an ability to master several other types. This category of schoolchildren should be assisted to develop those opportunities that are relevant to the chosen profession.

Option 1.2.a is the unambiguous impossible choice”, when the professional need and the available opportunity do not coincide. The student should be assisted in resolving the contradiction.

Option 1.2.b is the unambiguous, multivalued, possibility-missing choice." The optant would like to master the profession for which he does not have abilities but has abilities for several other professions. Such students should focus on the development of those opportunities that are relevant to the chosen professions.

Variant 1.2.c is the “unambiguous possible-absent choice”. The proportion of such optants is small. It is necessary to determine whether the optant omitted this answer in the questionnaire, or whether it is option 1.2.d.

Option 1.2.d is the unambiguous opportunity-indefinite choice”, when a student, choosing one profession cannot determine his abilities. The optant should be assisted in identifying them.

The block of multi-choices, when the optant marks several attractive professions accounts for 74.1 % of the total number of options. Moreover, it is more characteristic of girls (57.1 %) than boys (42.9 %). The difference between the classes is not significant. This is the most common situation. On the one hand, this is caused by exogenous factors mentioned above, on the other hand, it is due to the age-related confusion caused by the need for unusual independence. This block splits into two options: multi-valued opportunity and multi-valued impossibility choices.

The first option assumes that optants give preference to several professions, which are provided with varying degrees of opportunities for their development. And the second type contains options for multiple choice of professions, which are not provided with appropriate abilities. Both of them have a "fine structure".

As for the first one, the following options are inherent in it.

Variant 2.1.a is the “ambiguous-unambiguous choice”, when the optant prefers several professions, if it is possible to master only one of them. This option is quite representative. Career counselors should lead the optant to the idea of the advisability of concentrating interests on the profession provided by abilities.

Option 2.1.b is the “ambiguous-unambiguous only possible choice”, which is characterized by the presence of many needs and possibilities. Obviously, the share of intersections (s) cannot be greater than the number of chosen professions (r) and the possibilities of their development (n). But r and n can be related in different ways. The options below are shown when  $r > n$ ,  $r < n$  and  $r = n$ . Of all the desirable types of professions, it is best to choose the one for which there are abilities.

Option 2.1.c is the “ambiguous-ambiguous only possible choice”, in which the number of needs and possibilities coincides, but only in one pair the choices are relevant to each other. The recommendations are obvious.

Option 2.1.d is the “ambiguous-ambiguous multiple-choice choice”, which is characterized by the presence of several possibilities (it does not matter:  $n < r$  or  $n > r$ ), of which only a part is relevant to some needs. This position of the optant shows that he is confused and does not know what he really needs. Most likely, he will look for the most affordable university, and later any other job that he can get. It is necessary to help him understand a full range of professional needs (X) and opportunities (M) to choose



those professions for which X and M are relevant to each other, and choose the profession that is most accessible for mastering ( It is possible) and is in demand in the labor market (Needed).

Option 2.1.d is the “ambiguous-ambiguous possibility -deficient choice”, in which all the available abilities meet certain needs, but not all of them are sufficient. The recommendations to the career counselor are the same.

Option 2.1.e is the “ambiguous-ambiguous possibility-excessive choice”, for which there are possibilities that “cover” all needs. The technology of promoting the optant is preserved.

Option 2.1.f – is the “ambiguous-ambiguous need-opportunity-relevant choice”, in which the number of needs and abilities coincides. The advice is the same.

Option 2.1.g is the “ambiguous-ambiguous conditionally relevant choice”, when the respondent marks an equal number of needs and opportunities that do not fully correspond to each other. The steps of the career counselor are the same.

Regarding the ambiguous impossible choice, it is inherent in a small group of optants, among whom 66.7 % are girls and 33.3 % are boys. It is no coincidence that Selivanova (2017) says that girls experience strong fluctuations in preferences over years, in the prestige of “female” professions gradually falls. However, a significant difference between the grades is not noticeable. This situation of professional choice splits into the following options.

Option 2.2.a is the “unambiguous-ambiguous opportunity-missing choice”, in which the only opportunity recognized by the optant is not relevant to any need. The career counselor should help the student identify opportunities for mastering at least one profession. In an extreme case, it is necessary to choose that which is the closest to one of the required types of professions.

Option 2.2.b is the “ambiguous-ambiguous possibility-missing choice”, in which no opportunity is relevant to any need. This is one of the most difficult situations for a career counselor. He has to understand reasons for this discrepancy and begin to search for professional needs and abilities of the optant. If such attempts are unsuccessful, it is possible to use external needs (H) and opportunities (B) as criteria for choosing the profession, choosing the most suitable one for the student.

Option 2.2.c is the “ambiguous opportunity-missing choice” when a certain number of professions is selected, however, the optant recognizes the lack of ability to master them. In this case, efforts should be focused on assisting the student in self-determination with his abilities.

Option 2.2.d is the “ambiguous opportunity-indefinite choice”, when the optant selects several professions and marks skills for their mastering but admits uncertainty of his abilities. This is a logically erroneous choice. The optant should specify whether he really thinks so. If he admits his fallacy, the situation is reduced to the previous one. Otherwise, it can be identified with other variants of the previous block.

In general, the presence of such a diversity of professional aspirations of schoolchildren suggests that the problem of choosing a profession is becoming rhetorical. Young people do not take into account their professional needs, which they cannot determine. They pay attention to available opportunities (USE scores, financial conditions of parents, predisposition to certain activities, abilities, etc.).

The third block of the zero-choice: the optant marks “Not yet decided”. It accounts for 2.8 % of the total number of responses. There are two choices: zero-valued opportunity and zero-valued

impossibility. In the first case, optants mark the presence of abilities for some professions. In the second case, the optant recognizes the absence of confidence in interests and possibilities of its development.

There are two options, which suggest similar actions of a career counselor.

Option 3.1.a is the “indefinitely need-based opportunity-available choice”, when the optants recognize a lack of interest in any profession, but mark the presence of the ability to master some of them. They should attend open days held by universities and colleges.

Option 3.1.b is the “conditionally definite-need-based, possible-available choice”, when optants recognize that they are not interested in any profession and mark their considering themselves to be capable of mastering some of professions. The career counselor should pay attention to possible logical errors in answering the questions. If the optant insists on the lack of professional certainty, the previous scheme should be used.

In the second case of the zero-valued impossibility choice, three options are implemented.

Firstly, there are optants who do not know what to want and what they can do. It is possible that no one helped them deal with their needs and capabilities. This option can be called "not determined need-and-opportunity." The career guidance technology should be utilized, although its failure should not be a surprise to the career counselor.

Secondly, the most exotic one is the double, logically erroneous option, when the respondent declares a desire to master several professions, but they are not attractive for him. On the one hand, the optant feels he is able to master some professions, and on the other hand, he marks uncertainty of such abilities. Recommendations are the same.

Thirdly, there is a hybrid logically contradictory option, when the optant intends to master several professions and declares the uncertainty of his professional choice. At the same time, he declares the uncertainty of his capabilities. Recommendations coincide with the previous ones.

After reviewing the options, it becomes possible to evaluate the apperceptivity and relevance of the choices.

The apperceptivity (A) of the needs and possibilities of the optants can be estimated as the fraction of all the choices in which there is no answer “Not yet decided” neither for professional needs (X0), nor for their capabilities (M0) or where they have not chosen the opportunity (M = 0) :

$$A = 579 - [1.2.c] - [1.2.c] - [2.2.c] - [2.2.c] - [3.1.a] - [3.1.c] - [3.2.c] - [3.2.c] - [3.2.B] = \\ = 579 - 3 - 2 - 6 - 2 - 4 - 5 - 4 - 1 - 2 = 579 - 29 = 550 \text{ or } 95.0 \%$$

There can be 23 gradations.

The relevance (R) of needs and opportunities can be estimated as the fraction of those choices in which there are many intersections of X and M ( $\eta \geq 0$ ):

$$P = [1.1] + [1.2] + [2.1] = 95 + 39 + 402 = 536 \text{ or } 92.6 \%$$

There are variations of this relevance. As an example of one of the 6 possible discrepancies within paired dispositions of the option situation (X↔M, X↔H, X↔B, M↔H, M↔B, H↔B), we refer to the opinion of other authors. Selivanova (2017) says that the absence (or narrow fragmentary) of vocational guidance led to serious discrepancies between intentions of adolescents (I want) and demanded professional areas (Need). Comparing the intention to join the army (I want) and the readiness for this (I can), Zernov (2016) says that the attitude to such a vital decision is far from unambiguous. He identifies 6

gradations of the attitude. Unfortunately, the author did not establish a correlation between these two answers, in order to find out how many people intend to serve and are ready for this.

The orientation of professional choice was evaluated using two indicators: focus and significance.

An assessment of the focus of choice showed that high school students consider attractive the first group of professions: managerial (14.2 %), creative (11.7 %), engineering (7.7 %), economic (7.5 %), government (7.3 %), sports (7.2 %), social and humanitarian (7.2 %). The group of professions in the legal (6.9 %), medical (6.8 %), scientific (6 %), political (5.6 %) and pedagogical (5.0 %) fields ranks second. The least demanded professions were agricultural (2.5 %), spiritual (religious) (1.3 %), and working (1 %) activities. But at the same time, part of the respondents chose several professions.

Volatility (V) can be estimated through its partial indicators:

V1 – the share of unambiguous options is presented in Table 1 (Block 1. Unambiguous choice). It is equal to  $95 + 39 = 134$  or 23.1 %.

Vn – the share of ambiguous options is presented in Table 1 (Block 2. Multiple choice). It is equal to  $402 + 27 = 429$  or 74.1 %. But differentiation is possible here, which makes it possible to estimate the share of double, triple and similar options.

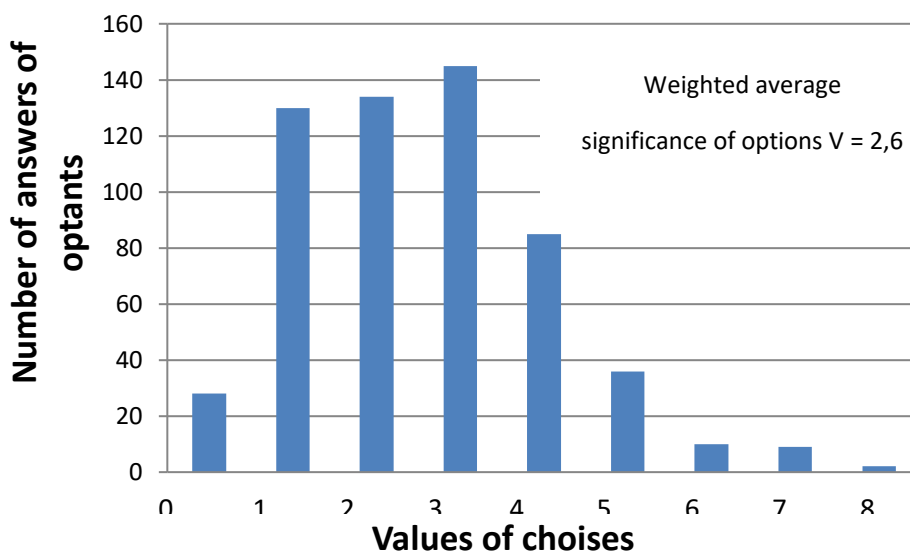
B0 – the share of zero-options is presented in Table 1 (Block 3. Zero-option). It is equal to  $9 + 7 = 16$  or 2.8 %.

The value of volatility can be expressed as the weighted average value of the choice  $B = \langle S \rangle = 2.6$ , obtained from the partial values of S (table 2) whose distribution is shown in Fig. 01.

**Table 02.** Distribution of values of professional choices

$3_i$	0	1	2	3	4	5	6	7	8	$\Sigma$
$N_i$	28	130	134	145	85	36	10	9	2	579

In Table 2:  $3_i$  – value of professional choices,  $N_i$  – the number of choices of the i-th significance.



**Figure 01.** Distribution of values of professional choices

It is evident that  $1 < B < 16$ , where 16 is the number of professions proposed for selection, including "Other". The seventeenth answer was "Not yet decided." It is clear that the case of unambiguous choice is ideal ( $B = 1$ ): each optant chooses only one profession. The worst case is when everyone chooses all options at the same time ( $B = 16$ ), which indicates the maximum uncertainty of choices.

Choosing only one profession in which needs and opportunities are relevant to each other will provide a young man with high motivation to master this profession. If necessary, it will be possible to determine and master a more popular profession. That is why, despite the uncertainty of professional needs and abilities, we consider the unambiguity of the choice relevant.

Therefore, the measure of optimal volatility is the proximity of its weighted average value to 1, which allows us to take the ratio:

$$V = (\langle Va \rangle - 1) / 16 = (2,6 - 1) / 16 = 0,1 \quad (\text{where } 0 \leq V \leq 0,9).$$

Volatility is acceptable.

The validity of professional choice could be evaluated using the same technology as for its awareness, but this would require a larger amount of data and a more extensive description of their meaningful analysis. Therefore, we limit ourselves to a brief version of the technology.

It seems possible to use motivation ( $\mu$ ) as one of the indicators of validity, estimated as the share of motivated choices, i.e. options justified by any motive. When reviewing the answers of the third block, it was identified that substantial motives (57.2 %) were dominant; the share of pragmatic ones was 27.6 %, unmotivated choices were made by 15.2 % of the respondents. Thus,  $\mu = 100 \% - 15.2 \% = 84.8 \%$ .

The low validity of the professional choice was emphasized by Konstantinovskiy and Popova (2015) who said that according to the results of the 2014 study conducted in nine regions of the Russian Federation, more than a quarter of the eleventh-graders were unable to answer why they have chosen this profession. At the same time, about 90 % of those who did not answer the question about their motivation have not yet chosen a profession. Schoolchildren do not know what they want and cannot explain why they want it. This underdevelopment of the motivational sphere is another reason that contributes to the general uncertainty of professional choice.

The second indicator of the validity of professional choice is the average specific number of motives per optant ( $m$ ). In our case,  $m = 3.3$ . This indicator characterizes the volatility of motivation in optants who made a justified choice of profession. Moreover, the general nature of motivation in tenth and eleventh graders differs slightly. The difference between boys and girls is much more pronounced. For boys, the average number of motives per one optant was 2.88, and for girls, it was 3.65. The great volatility of motivation in girls was observed by other researchers (Selivanova, 2017).

## 7. Conclusion

The results obtained are in compliance with disparate data obtained by other researchers studying other target audiences. The technology provides a multilateral assessment of professional certainty of high school students, which can be assessed as satisfactory.

The developed indicators and the intended scenario for their assessment do not fully assess professional certainty of students. There were many unsolved issues, including self-assessment of

professional certainty by in middle and lower graders, adequacy of students' perceptions of the demand for professions in the labor market. The technology for analyzing the validity of professional choices has not been fully described. It is necessary to reduce the considered indicators into a single index of professional certainty, etc.

It becomes obvious that the technology of career guidance should be of a differentiated nature. There can be three levels of its structure according to the degree of complexity of the work being done: a) easy (corrective) – for unambiguously determined students; b) average (contributing) – for ambiguously determined students; c) difficult – full-scale career guidance for undecided schoolchildren. The second level covers the most numerous group of schoolchildren, and the third one – the group with a minimum number. The differentiation saves efforts of a career counselor by working separately with each group.

It is not clear if it is possible to use the technology as a tool for a uniform assessment of the results of other types of choice.

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