

DEUTSCHE internationale Zeitschrift

für zeitgenössische Wissenschaft

Nº38
2022



DIZZW 2020

DEUTSCHE internationale Zeitschrift
für zeitgenössische Wissenschaft

ISSN (Print) 2701-8369
ISSN (Online) 2701-8377

**Deutsche internationale Zeitschrift
für zeitgenössische Wissenschaft**

...
№38 2022

**German International Journal
of Modern Science**

...
№38 2022

Deutsche internationale Zeitschrift für zeitgenössische Wissenschaft ist eine internationale Fachzeitschrift in deutscher, englischer und russischer Sprache.

Periodizität: 24 Ausgaben pro Jahr
Format - A4
Alle Artikel werden überprüft.
Freier Zugang zur elektronischen Version des
Journals

German International Journal of Modern Science is an international, German/English/Russian/Ukrainian language, peer-reviewed journal.

Periodicity: 24 issues per year
Format - A4
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Artmedia24

Anschrift: Industriestraße 8,74589 Satteldorf
Deutschland.

E-mail: info@dizzw.com

WWW: www.dizzw.com

Chefredakeur: Reinhardt Roth

Druck: Einzelfirma Artmedia24, Industriestraße
8,74589 Satteldorf Deutschland

Artmedia24

Address: Industriestrasse 8,74589 Satteldorf Germany.

E-mail: info@dizzw.com

WWW: www.dizzw.com

Editor in chief: Reinhardt Roth

Printing: Artmedia24, Industriestrasse 8,74589 Satteldorf Germany.

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In case of materials reprinting - link to journal is re-
quired.

Materials are publishing in author's edition.

Edition: № 38/2022 (August) – 38th

Passed in press in August 2022

Printed in August, 2022

Printing: Artmedia 24, Industriestrasse 8,
74589 Satteldorf, Germany.

artmedia²⁴

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ALTERNATIVE MEASURES OF CENTRAL TENDENCY

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[DOI: 10.5281/zenodo.7002877](https://doi.org/10.5281/zenodo.7002877)

Abstract

This paper presents two new estimators of the expectation of a random variable X , which are also unbiased and consistent as an arithmetic mean but more efficient. The first one is called center owing to the fact that its value is usually located between the mean and the median of the analyzed data. The second one is called C2 statistic. Both statistics are weighted averages. The center and C2 are computed with weights which are functions of the remoteness of each observation from other. Thus, these statistics use all available data in contrast to the median or a trimmed mean. They are less sensitive to the effect of outliers than the arithmetic mean because of the fact that the outlying observations receive smaller weights than these which are close to the median. The article presents mathematical and empirical proofs of the above statements.

Keywords: weighted average; expectation; efficiency

Introduction

Suppose a discrete random variable X takes values X_1, X_2, \dots, X_n and P is the probability mass function of X . Then, the expectation $E[X]$ is a number which can be given by (1).

$$E[X] = \sum_{i=1}^n X_i P(X = X_i) = X_1 P_1 + X_2 P_2 + \dots + X_n P_n \quad (1)$$

Equation (1) implies that the expected value $E[X]$ is a weighted average. Giving different values of P_i one can yield different values of $E[X]$. Suppose X_1 and X_n are the minimum and the maximum values in the set, respectively. If $P_1 = 1$ and $P_2 = P_3 = \dots = P_n = 0$, then $E[X] = X_1$ or the expected value will be equal to the smallest observation. If $P_n = 1$ and $P_1 = P_2 = \dots = P_{n-1} = 0$, then $E[X] = X_n$ or the expectation will be the largest observation. If n is an even number and $P_{n/2} = 0.5$, $P_{n/2+1} = 0.5$ and all other $P_i = 0$ then the expectation will be the median of the data set. $E[X]$ will also be equal to the median if n is an odd number, $P_{\text{int}(n/2)+1} = 1$ and all other $P_i = 0$. Suppose $P_1 = P_2 = \dots = P_n = 1/n$, then the expected value will be the arithmetic mean of all observations. Since $P_1 + P_2 + \dots + P_n = 1$ in each of the above mentioned cases one can conclude that all statistics, such as mean, median, largest observation, smallest observation are unbiased estimators of the expected value $E[X]$. Both the largest and the smallest observations in a data set do not give information about the centre of a distribution. Also these statistics do not take into account all observations in a data set. Owing to these facts they are not appropriate for describing of central tendency.

The median of a data set also neglects all observations except the middle one or two but present the central tendency better than the mean in these cases when there are outliers in data or the graph of a distribution is strongly skewed. In addition, the standard error of the median is 1.25 times greater than this of the arithmetic mean assuming a normality of distribution. As a result,

the median is estimated as a less accurate estimator than the mean [4, p.94].

It seems that the mean of a data set is the most appropriate statistic for describing of the centre of a distribution [1, 2, 4], among others. It should be remarked that the mean has a great drawback. This statistic derives from equal weighting of all observations. That is to say, the furthest observations and these which are close to the centre of a distribution are treated in the same manner. Let σ is the standard deviation of a data set and ε is a very small real number, such as ε tends to 0. Using equal weights supposes the correctness of (2). The last is obviously in contradiction with (1).

$$P(E[X] + 3\sigma - \varepsilon < X < E[X] + 3\sigma + \varepsilon) = P(E[X] - \varepsilon < X < E[X] + \varepsilon) \quad (2)$$

This approach might be reasonable when the analyzed data have a perfect uniform distribution but seems inappropriate in other cases, especially for skewed bell-shaped distributions or when the size of a data set is not great. In order to reduce the effect of extreme observations over estimated parameters, various technics are utilized by researches, e.g., transformations, truncation, robust procedures, etc. Most of these treatments are based on data cleaning [3].

As was supposed above the expected value $E[X]$ is a kind of a weighted average and can be given by a common equation (3).

$$\bar{X} = \sum_{i=1}^n w_i \cdot X_i / \sum_{i=1}^n w_i \quad (3)$$

According to [1, 5], the weighted average has a minimum variance $\text{Var}(\bar{X})$, which can be given by (4), when the weights w_i are inverse proportional to the variances of the observations (5).

$$\text{Var}(\bar{X}) = c / \sum_{i=1}^n w_i \quad (4)$$

$$w_i = c / \text{Var}(X_i) \quad (5)$$

The coefficient c in (4) and (5) is a coefficient of proportion by means of the weighted sample variance given by (6).

$$c = \sum_{i=1}^n w_i \cdot (X_i - \bar{X})^2 / (n-1) \quad (6)$$

If one puts (6) into (4) then the final formula of the minimum variance of a weighted average can be written as (7) [4, p.94].

$$\text{Var}(\bar{X}) = \sum_{i=1}^n w_i \cdot (X - \bar{X})^2 / [(n-1) \cdot \sum_{i=1}^n w_i] \quad (7)$$

Equation (7) must easily be yielded by a parametric least squares adjustment [1, p.182]. If $w_1 = w_2 = \dots = w_n = 1$ then equation (7) turns to (9).

Using the Cauchy-Schwarz inequality it is easy to prove (8) [5].

$$\text{Var}(\bar{X}) = c / \sum_{i=1}^n w_i \leq \sum_{i=1}^n w_i^2 \cdot \text{Var}(X_i) / \left(\sum_{i=1}^n w_i \right)^2 \quad (8)$$

Based on equations (3) and (7) one can see that any weighted average is an unbiased and consistent estimator of the expected value $E[X]$. Equation (8) shows that a weighted average is more efficient than an arithmetic mean when the variances of observations are known due to the fact that the weights used for calculation of the arithmetic mean are a function of the size of the data set but not of the variances of observations.

More complicated is the case when the variances of observations are unknown. In order to solve this problem one usually takes $w_1 = w_2 = \dots = w_n = 1$. Thus, the variance of the arithmetic mean can be given by (9).

$$\text{Var}(\text{arithmetic mean}) = n \cdot \text{Var}(X) / n^2 = \text{Var}(X) / n \quad (9)$$

If we replace the right side of (8) with (9) we will obtain (10).

$$\text{Var}(\bar{X}) = c / \sum_{i=1}^n w_i \leq \text{Var}(X) / n \quad (10)$$

Equation (10) clearly shows that there is a weighted average estimator of the expected value that has less variance than the well-known arithmetic mean. Thus, there is a more efficient estimator of $E[X]$. Such two new estimators of the expectancy are presented in the chapter below.

C2 Statistic

Suppose a discrete random variable X takes values X_1, X_2, \dots, X_n . We will show that each data point X_i can be presented as a function of other data points. Thus, the variance of each X_i is related with the variances of the rest variables $X_{j \neq i}$.

Proposition 1. If X_1, X_2, \dots, X_n ($n \geq 2$) are uncorrelated random variables with finite non-zero variances, then

$$X_i = \sum_{j=1}^n X_j \cdot D_{i,j} / \sum_{j=1}^n D_{i,j} \quad (11)$$

where:

$$D_{i,i} = \sum_{j=1}^n (X_i - X_j)^2 \quad (12)$$

$$D_{i,j} = \sum_{k=1}^n (X_i - X_k) \cdot (X_j - X_k) \quad (13)$$

Note: If observations X_k are random results from k measurements of a quantity X^{true} than the differences $X_i - X_j$ are differences between the true errors e_i and e_j of X_i and X_j , because of the relation $X_i - X_j = X^{\text{true}} + e_i - (X^{\text{true}} + e_j) = X^{\text{true}} + e_i - X^{\text{true}} - e_j = e_i - e_j$.

Proof of Proposition 1.

The proof below will concern X_1 variable. Due to the fact that the variables can be reordered, the equations below will be true for each variable X_i . Let $n=2$, then

$$X_1 = (X_1 \cdot D_{1,1} + X_2 \cdot D_{1,2}) / (D_{1,1} + D_{1,2}) \quad (14)$$

$$X_1 \cdot D_{1,1} + X_1 \cdot D_{1,2} = X_1 \cdot D_{1,1} + X_2 \cdot D_{1,2}$$

$$X_1 \cdot D_{1,2} - X_2 \cdot D_{1,2} = 0$$

$$(X_1 - X_2) \cdot D_{1,2} = (X_1 - X_2) \cdot [(X_1 - X_1) \cdot (X_2 - X_1) + (X_1 - X_2) \cdot (X_2 - X_2)] = 0$$

$$(X_1 - X_2) \cdot [0 \cdot (X_2 - X_1) + (X_1 - X_2) \cdot 0] = 0$$

$$0 = 0$$

Let $n=3$, then

$$X_1 = (X_1 \cdot D_{1,1} + X_2 \cdot D_{1,2} + X_3 \cdot D_{1,3}) / (D_{1,1} + D_{1,2} + D_{1,3}) \quad (15)$$

$$X_1 \cdot D_{1,1} + X_1 \cdot D_{1,2} + X_1 \cdot D_{1,3} = X_1 \cdot D_{1,1} + X_2 \cdot D_{1,2} + X_3 \cdot D_{1,3}$$

$$(X_1 - X_2) \cdot D_{1,2} + (X_1 - X_3) \cdot D_{1,3} = 0$$

$$(X_1 - X_2) \cdot [(X_1 - X_1) \cdot (X_2 - X_1) + (X_1 - X_2) \cdot (X_2 - X_2) + (X_1 - X_3) \cdot (X_2 - X_3)] +$$

$$+ (X_1 - X_3) \cdot [(X_1 - X_1) \cdot (X_3 - X_1) + (X_1 - X_2) \cdot (X_3 - X_2) + (X_1 - X_3) \cdot (X_3 - X_3)] = 0$$

$$(X_1 - X_2) \cdot [0 + 0 + (X_1 - X_3) \cdot (X_2 - X_3)] + (X_1 - X_3) \cdot [0 + (X_1 - X_2) \cdot (X_3 - X_2) + 0] = 0$$

$$(X_1 - X_2) \cdot (X_1 - X_3) \cdot (X_2 - X_3) + (X_1 - X_3) \cdot (X_1 - X_2) \cdot (X_3 - X_2) = 0$$

$$(X_1 - X_2) \cdot (X_1 - X_3) \cdot (X_2 - X_3) - (X_1 - X_2) \cdot (X_1 - X_3) \cdot (X_2 - X_3) = 0$$

$$0 = 0$$

Using the same logic, let $n = n$, then

$$X_1 = (X_1 \cdot D_{1,1} + \dots + X_n \cdot D_{1,n}) / (D_{1,1} + \dots + D_{1,n}) \quad (16)$$

$$X_1 \cdot D_{1,1} + X_1 \cdot D_{1,2} + X_1 \cdot D_{1,3} + \dots + X_1 \cdot D_{1,n} = X_1 \cdot D_{1,1} + X_2 \cdot D_{1,2} + X_3 \cdot D_{1,3} + \dots + X_n \cdot D_{1,n}$$

$$(X_1 - X_2) \cdot D_{1,2} + (X_1 - X_3) \cdot D_{1,3} + \dots + (X_1 - X_n) \cdot D_{1,n} = 0$$

$$(X_1 - X_2) \cdot [(X_1 - X_1) \cdot (X_2 - X_1) + (X_1 - X_2) \cdot (X_2 - X_2) + (X_1 - X_3) \cdot (X_2 - X_3) + \dots + (X_1 - X_n) \cdot (X_2 - X_n)] +$$

$$(X_1 - X_3) \cdot [(X_1 - X_1) \cdot (X_3 - X_1) + (X_1 - X_2) \cdot (X_3 - X_2) + (X_1 - X_3) \cdot (X_3 - X_3) + \dots + (X_1 - X_n) \cdot (X_3 - X_n)] +$$

$$\dots \dots \dots$$

$$(X_1 - X_n) \cdot [(X_1 - X_1) \cdot (X_n - X_1) + (X_1 - X_2) \cdot (X_n - X_2) + (X_1 - X_3) \cdot (X_n - X_3) + \dots + (X_1 - X_n) \cdot (X_n - X_n)] = 0$$

After some algebraic manipulations of the above equation one will end up to $0 = 0$.

Therefore, equation (1) is true. Based on Proposition 1, we can define Proposition 2.

Proposition 2. If X_1, X_2, \dots, X_n ($n \geq 2$) are uncorrelated random variables with finite non-zero variances, then each variable X_i can be defined as a function of other variables X_j

$$X_i = \sum_{j \neq i} X_j \cdot D_{i,j} / \sum_{i \neq j} D_{i,j} \quad (17)$$

where:

$$D_{i,j} = \sum_{k=\{1,2,\dots,n\} \setminus \{i,j\}} (X_i - X_k) \cdot (X_j - X_k) \quad (18)$$

Proof of Proposition 2.

Again, the proof will be done for X_1 . Let start with equation (16).

$$X_1 = (X_1 \cdot D_{1,1} + X_2 \cdot D_{1,2} + \dots + X_n \cdot D_{1,n}) / (D_{1,1} + D_{1,2} + \dots + D_{1,n})$$

$$X_1 \cdot (D_{1,1} + D_{1,2} + \dots + D_{1,n}) = X_1 \cdot D_{1,1} + X_2 \cdot D_{1,2} + \dots + X_n \cdot D_{1,n}$$

$$X_1 \cdot D_{1,2} + X_1 \cdot D_{1,3} + \dots + X_1 \cdot D_{1,n} = X_2 \cdot D_{1,2} + X_3 \cdot D_{1,3} + \dots + X_n \cdot D_{1,n}$$

$$X_1 \cdot (D_{1,2} + D_{1,3} + \dots + D_{1,n}) = X_2 \cdot D_{1,2} + X_3 \cdot D_{1,3} + \dots + X_n \cdot D_{1,n}$$

Therefore, we can write (19).

$$X_1 = \sum_{j \neq 1} X_j \cdot D_{1,j} / \sum_{i \neq 1} D_{1,j} \quad (19)$$

If we can write (19) for X_1 , then we can write (17) for each variable in the analyzed set.

Consequently, the variance of each variable can be presented by the variances of the other variables and coefficients $D_{i,j}$. In case of X_1 we can write (20).

$$\begin{aligned} \text{Var}(X_1) &= \left(\frac{D_{1,2}}{\sum_{j \neq 1} D_{1,j}} \right)^2 \cdot \text{Var}(X_2) + \dots + \\ &\left(\frac{D_{1,n}}{\sum_{j \neq 1} D_{1,j}} \right)^2 \cdot \text{Var}(X_n) \end{aligned} \quad (20)$$

Suppose that $\text{Var}(X_2) = \text{Var}(X_3) = \dots = \text{Var}(X_n) = \sigma^2$, then (20) turns in (21).

$$\text{Var}(X_1) = \sigma^2 \cdot \sum_{j \neq 1} D_{1,j}^2 / \left(\sum_{j \neq 1} D_{1,j} \right)^2 \quad (21)$$

Based on this logic for the variance of the variable X_i one can write (22).

$$\text{Var}(X_i) = \sigma^2 \cdot \sum_{j \neq i} D_{i,j}^2 / \left(\sum_{j \neq i} D_{i,j} \right)^2 \quad (22)$$

Equation (22) clearly shows that if $X_i = X_j$ then $\text{Var}(X_i) = \text{Var}(X_j)$. Otherwise, $\text{Var}(X_i) \neq \text{Var}(X_j)$. In order to calculate an weighted average of the set $X_1, X_2,$

\dots, X_n by (7) one needs to obtain the weight of each variable. Using equation (22) these weights can be given by (23).

$$w_i = \left(\sum_{j \neq i} D_{i,j} \right)^2 / \sum_{j \neq i} D_{i,j}^2 \quad (23)$$

Using weights (23) in equation (3) one will obtain a new statistic, which is called C2. As can be seen C2 is based on the differences among true errors of data points. In this manner, each observation receives a weight with accordance to its deviation from other observations.

C1 or Center Statistic

One might have seen that there is a situation where equation (23) cannot be calculated, i.e. its denominator is equal to 0. This situation occurs when $n-1$ observations are equal each other but one observation differs from them. In this case the different observation should be removed or a new approach of calculating of weights should be used.

As has been proved above, the variance of each data point in a data set can be presented as a function of variances of other observations. Therefore, the data set defines the variance of each observation. The closer is a data point to the expectation the smaller is its variance. Physically this relation can be presented with the sum of the squares of distances from a given observation to other. This relation is described with equation (12). Based on this fact, one can obtain weights (24).

$$w_i = 1/D_{i,i} \quad (24)$$

So, if one uses weights (24) in equation (3) they will obtain a new statistic, which is named C1 or center statistic. This statistic is usually located between the arithmetic mean and the median of a given data set. It is important to be remarked that there is a functional correlation between weights (23) and (24). As a result, both C2 and center will give practically the same results when the size of data is great. All these statements will be proved with the examples below.

Example 1

Let we have the data set: **12, 14, 14, 15, 20**. Using equations (12) and (13) one can calculate the coefficients D_{ij} as given in Table 1.

Table 1

| Coefficients D_{ij} | | | | |
|-----------------------|-----------|-----------|-----------|------------|
| D_{ij} | | | | |
| 81 | 51 | 51 | 36 | -39 |
| 51 | 41 | 41 | 36 | 11 |
| 51 | 41 | 41 | 36 | 11 |
| 36 | 36 | 36 | 36 | 36 |
| -39 | 11 | 11 | 36 | 161 |

In order to check Proposition 2 we will use the values in the first row of Table 1, which correspond to the first data point, i.e. 12. So, one can calculate that (14 x

$51 + 14 \times 51 + 15 \times 36 + 20 \times -39) / (51 + 51 + 36 + -39) = 1188 / 99 = 12$.

In case of the second observation, i.e. 14, we have $(12 \times 51 + 14 \times 41 + 15 \times 36 + 20 \times 11) / (51 + 41 + 36 + 11) = 1946 / 139 = 14$. For the rest observations one is able to check Proposition 2 by themselves.

Using equations (23) and (24) we can compute the weights of each data point concerning both C2 and the center statistic. These weights are given in Table 2.

Table 2

Weights of the data set from Example 1 calculated by equations (23) and (24)

| Weights | |
|---------|---------|
| (24) | (23) |
| 0.01235 | 1.22222 |
| 0.02439 | 3.39024 |
| 0.02439 | 3.39024 |
| 0.02778 | 4.00000 |
| 0.00621 | 0.11801 |

If one calculates the coefficient of correlation R between the weights in the first and the second columns in Table 2 they will find that $R=1$. Thus, there is a functional correlation between weights (23) and (24). We

are going to restrict ourselves to prove this fact only in an empirical mode for now and focus on the values of the mean, C2, center and median of our data set. Their values and standard errors are given in Table 3.

Table 3

Mean, C2, Center and Median of the data

| | Mean | C2 | Center | Median |
|-------|-------|-------|--------|--------|
| Value | 15.00 | 14.19 | 14.42 | 14.00 |
| SE | 1.342 | 0.512 | 0.863 | |

According to Table 3, both statistics C2 and the center have less standard errors than the arithmetic mean. Thus, they are more efficient estimators of an expectation $E[X]$ in case of the data set of Example 1. It can be seen that they are located between the mean and the median but tend to the median.

Example 2

Suppose the data set below contains the monthly wages of 28 randomly selected employees in a company.

520 660 730 810 820 865 890 915 975 1000
1050 1080 1160 1210 1740
1800 1820 2200 2200 2300 2450 2500 2550
2600 2650 2700 3400 4450

The mean, C2, the center and the median wage values with their standard errors are given in Table 4.

Table 4

Mean, C2, Center and Median of Example 2 data

| | Mean | C2 | Center | Median |
|-------|--------|--------|--------|--------|
| Value | 1715.9 | 1625.9 | 1631.1 | 1475.0 |
| SE | 182.8 | 141.4 | 144.2 | |

As can be seen from Table 4, C2 and the center have close values and standard errors. Both statistics are located between the median and the arithmetic

mean of the analyzed data set and their standard errors are less than the standard error of the mean.

Table 5

Weights (23) and (24) of each observation concerning Example 2

| Number | (23) | (24) | Number | (23) | (24) |
|--------|---------|---------|--------|---------|---------|
| 1 | 0.60788 | 0.63071 | 15 | 1.66783 | 1.62896 |
| 2 | 0.71252 | 0.72926 | 16 | 1.65549 | 1.61733 |
| 3 | 0.77156 | 0.78486 | 17 | 1.64841 | 1.61067 |
| 4 | 0.84475 | 0.85379 | 18 | 1.31220 | 1.29403 |
| 5 | 0.85433 | 0.86281 | 19 | 1.31220 | 1.29403 |
| 6 | 0.89860 | 0.90450 | 20 | 1.19420 | 1.18290 |
| 7 | 0.92400 | 0.92843 | 21 | 1.02192 | 1.02064 |
| 8 | 0.94997 | 0.95288 | 22 | 0.96771 | 0.96959 |
| 9 | 1.01445 | 1.01361 | 23 | 0.91559 | 0.92051 |
| 10 | 1.04214 | 1.03969 | 24 | 0.86574 | 0.87355 |
| 11 | 1.09881 | 1.09306 | 25 | 0.81824 | 0.82882 |
| 12 | 1.13349 | 1.12572 | 26 | 0.77313 | 0.78633 |
| 13 | 1.22754 | 1.21430 | 27 | 0.35603 | 0.39352 |
| 14 | 1.28662 | 1.26994 | 28 | 0.12466 | 0.17562 |

Table 5 contains a modification (25) of weights (23) and (24) of each observation of the example data, where n is the size of the data set. Modification (25) does not change the final results but modifies the weights in such manner that they will be around 1. Thus, the sum of all weights will be equal to n .

$$w'_i = n \cdot w_i / \sum_{i=1}^n w_i \quad (25)$$

If one calculates the coefficient of correlation R between the weights in both columns of Table 5 they will find that $R=1$. Thus, the functional correlation between weights (23) and (24) is also supported by these data. Table 5 also illustrates the ratios among the weights of the central data points and those close to the periphery of the distribution of our data. One can see that the highest wage of 4450 currency unit, which is in

the range from 2σ to 3σ and cannot be treated as an outlier, has the least weight in case of C2 and the center. As a result, its effect over these statistics is less than the arithmetic mean. This data point also inflates the standard error of the mean. If this observation is trimmed the mean will be equal to 1614.6 with a standard error of 158.0 currency units, values which are close to the C2 and the center and their standard errors.

Example 3

In order to illustrate that with increasing of the size of a data set the difference between C2 and the center tends to zero, the values of discussed statistics and their standard errors are given in Table 6 below. The values in Table 6 are based on six random number generations from uniform distribution with the lowest and the highest values 0 and 100, respectively.

Table 6

| Means, C2-s, Centers and Medians, derived from random simulations of U(0, 100) | | | | | |
|--|-------------|-------|-------|--------|--------|
| Number of observations | Description | Mean | C2 | Center | Median |
| 10 | Value | 56.00 | 62.05 | 60.97 | 71.86 |
| | SE | 11.93 | 10.01 | 10.41 | |
| 25 | Value | 49.51 | 49.74 | 49.75 | 50.10 |
| | SE | 5.78 | 4.47 | 4.57 | |
| 50 | Value | 50.39 | 52.61 | 52.54 | 53.28 |
| | SE | 4.04 | 3.16 | 3.19 | |
| 100 | Value | 50.52 | 51.50 | 51.49 | 52.92 |
| | SE | 2.99 | 2.43 | 2.44 | |
| 150 | Value | 48.38 | 48.15 | 48.15 | 48.05 |
| | SE | 2.37 | 1.90 | 1.90 | |
| 200 | Value | 47.07 | 46.68 | 46.68 | 44.98 |
| | SE | 2.17 | 1.78 | 1.78 | |

If one performs some similar experiment(s) they will yield different values from those given in Table 6. The same will be two facts:

- If the size of a data set is getting bigger the values and standard errors of C2 and the center will be getting closer.
- The standard errors of C2 and the center will always be less than the standard error of the mean concerning any data set.

Conclusion

The current article shows that an arithmetic mean is not the most efficient estimator of an expectancy. The mean is a time-proven estimator but really sensitive to effect of outliers and fringeliers due to the equal weighting of all observations in a data set. The classical weighting relies on the fact that the sample derives from population which kernel is bell-shaped and almost symmetric around the expectation and as a result, the tail observations in both sides mutually eliminate their common effect over the expectation. Also a huge number of observations is supposed. The above assumptions are not always met in the practice. So, the equal weighting is a good approximation of the best weights

but more artificial and subjective. As shown by Proposition 2 above, the variance of each observation is a function of the variances of other observations in a data set. Consequently, data points determine by themselves which of them are outliers, accepted members or mid-values. Let we follow our data.

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MEDICAL SCIENCES

DAMAGE OF DENTAL HARD TISSUES IN PREGNANT WOMEN AND BASIS OF THERAPEUTICAL-PROPHYLACTICAL MEASURES IN GEORGIA

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[DOI: 10.5281/zenodo.7002881](https://doi.org/10.5281/zenodo.7002881)

Abstract

Despite some sublime halo of future motherhood and belief in physiologic process of pregnancy itself, carrying healthful character for the female organism, the course of pregnancy itself is significant psychoemotional, immunological and metabolic load on female organism. Complicated psychophysiological changes of the organism during pregnancy are accompanied by expressed damage to the condition of oral cavity [1].

Pregnant women are carrying one of the highest risks of developing dental diseases. Main diseases of oral cavity faced by women, are tooth caries and periodontal diseases. One of the problems of pregnancy is the condition of teeth. Even though pregnancy itself is a physiological process, accompanied by its specifics, changes in the hormonal background significantly affects metabolic processes in the organism of future mother [2, 3]. Metabolism of fat, proteins, carbohydrates, and minerals significantly change, which is linked to the formation of new organism. Metabolism of minerals is changed due to the need of higher calcium amount required for the formation of fetal bones, which is extracted from the bone tissues of future mother. Changes in calcium metabolism cause decrease in remineralization properties of saliva.

Normally, enamel strengthening is supported by the actions of calcium and phosphorus contained in the saliva. During pregnancy, their quantity decrease, PH of saliva also decreases, which causes disturbance of acid-base balance of the oral cavity and leads to intensive multiplication of microorganisms, causing caries. According to the studies, such changes in the mineral metabolism weakens density of dental tissues and teeth become weak, easily destructible [4].

Keywords: Pregnant Women, therapeutic-prophylactical measures, dental hard tissues.

Introduction

On the background of changed reactivity and decrease in the resistance of organism in pregnant woman, hidden sources of the infection can lead to serious complications, such as exacerbation of chronic odontogenic sources of infections [5, 6].

Scientific studies and practical experience show that increase in the vulnerability to caries in pregnant women, can have negative results for fetus. High level of caries causing infections in mother can lead to caries formation in babies. [7].

First clinical signs of dental caries in pregnant women appear on sixth-seventh month of pregnancy, which is connected to the peak of skeletal mineralization of the fetus and appearance of calcium deficit in pregnant women. Fetus takes up 80% of calcium during third trimester of pregnancy, causing homeostatic stress in mother's organism. Clinical image worsens with the progression of pregnancy, especially when having toxemia of the second half of pregnancy [8, 9].

Clinical specifics of caries process, especially during pregnancy with late toxemia is its acute course. Seldom in pregnant women, especially during early and late toxemia, increase of dental sensitivity against chemical, thermal and mechanical irritators is remarked, chronic caries process is characterized by asymptomatic course. In pregnant women one may also see non-caries damage of teeth: wedge shaped defects, hyperesthesia of hard tissues, vertical pathological erasability [10].

Prevalence and intensity of dental caries in women increases depending on the quantity of previous pregnancies, with labor outcomes. Along with other factors, disturbance in the concentration of protein and urea, decrease in frequency of salivation, decrease in salivary PH, increase its viscosity, changes in the mineral content of oral fluids have significant effect on pathogenesis of dental caries in pregnant women. During late toxemia of pregnancy mentioned salivary changes are more expressed [11,12].

Studies showed that dental diseases in pregnant women arise due to the influence of adverse factors on the organism, removal of which shall be considered during processing regional complex prophylactic programs, methods and means of the prophylactics of dental diseases.

The most effective tool is to plan a prophylactic program based on preliminary situational analysis of dental diseases, considering climatic-geographical, ecological and economical specifics of the country or particular regions. However, lack of general data regarding spread of dental diseases on the territory of Georgia, complicates planning of national as well as regional prophylactic programs. Primarily, this refers to the female population during pregnancy.

Initial manifestations of early forms of dental caries in pregnant women remain poorly studied, intensity of its development and specifics of damage of the dental surface must be considered while planning prophylactic programs, which are more important for Georgia, where the majority of sources of the drinking water is characterized by too low concentration of Fluorides (0.35-0.45 mg/L), [13.,14.]

Despite significant experience in the declared prophylactic direction of healthcare in our country, scientific based prophylactic system of dental diseases in pregnant women is practically not existing, effective prophylactic programs are not included; additionally, creating such programs allows more effective use of potential opportunities of already existing methods and means of prophylaxis.

Considering the above, the aim of the current study is to perform the situational analysis of the diseases of the dental hard tissues in pregnant women, al-

lowing active monitoring of risk-factors in disease development, in order to develop scientific-based therapeutical-prophylactical programs considering the critical periods of pregnancy.

Methods and material

Dental examination of 170 pregnant women aged 18 to 40 years has been conducted, under observation of the dental office in two regional Female consultation centers in Tbilisi (clinic "Gidmed" at N10 Khudadov str. and "Mkurnali" at N87 Ts. Dadiani str.)

During initial examination, each pregnant was informed about character of the study. Data of the primary dental examination was entered in a specifically developed "Card of oral cavity examination in pregnant women", where information about dental status and dynamics during following examinations were added along with passport data, information about obstetric-gynecologic status and specifics of the course of pregnancy were entered as well. All women were examined for 3 times.

During initial address to the dentist, in the second half of pregnancy with gestation age 20-22 weeks and during 34-38 weeks of pregnancy. During late initial visit (after 20 weeks of gestation) they were examined again on 34-38 weeks. Inclusion criteria in the study were pregnant women living in the given climatic-geographic zone. Exclusion criteria were pregnant women with severe extragenital and obstetric pathologies and refusal to participate in the study at any step.

For comparable assessment of the dental hard tissues, efficacy of therapeutical-prophylactic measures and data of obstetric-gynecologic analyses, study participants were divided based on age and term of pregnancy: (Table 1,2)

Table 1

Division of examined pregnant according to age group

| Age groups | "Gidmed" clinic | "Mkurnali" clinic | Total % |
|--------------|-----------------|-------------------|-------------------|
| 18-24 | 34 | 11 | 45 (26,47%) |
| 25-33 | 35 | 15 | 70 (41,17%) |
| 34-40 | 41 | 14 | 55 (32,36%) |
| Total | 130 | 40 | 170 (100%) |

Table 2

Division of pregnant according to gestation age

| Gestation age, wks | "Gidmed" clinic | "Mkurnali" clinic | Total % |
|---|-----------------|-------------------|------------|
| I trimester (from conception to 13 wk.) | 60 | 13 | 73 (43%) |
| II trimester (13-26 wk.) | 33 | 7 | 40 (23,5%) |
| III trimester (27-40 wk.) | 37 | 20 | 57 (33,5%) |

Dental examinations were conducted with standard methods: Collection of medical history, examination, probing, percussion. Condition of hard dental tissues were determined by calculating the intensity – CFR, indicator of intensity as sum of teeth with caries (C), teeth with filling (F) and removed teeth (R) of the patient and prevalence (%) of dental caries. Examination of all teeth was performed revealing developing caries process on the stage of spot, with method of intravital staining.

For more precise assessment quantity of caries lesions on different surfaces of the same tooth were considered. Index received during such assessment is marked as CFR.

Hygienic condition of oral cavity were calculated using simplified index Green-Vermilion – ONI-S (Oral Hygiene Indices-simplified), which is a double index and consist of two components: Index of dental plaques – DI-S and index of dental calculi – CI-S. Hygienic index OHI-S is calculated with formula: $OHI-S = (DI-S) + (CI-S)$.

Data are processed statistically using program SPSS-24.

Results and discussion

It is known that during pregnancy quantitative level of mineral materials in saliva decrease, as a result acidity of oral cavity elevate, which leads to acid-base balance disturbance of the oral cavity, and marked increase in the amount of caries causing microorganisms.

As a result, such changes in mineral metabolism decrease density of dental enamel and teeth become weak and vulnerable to the destruction [8].

Study results reflected in the table 3, show massive spread of dental caries among pregnant women and range from 61% to 98.8% ($p < 0.002$). Similar image was characteristic to the index of caries intensity, which was characterized by the increase of CFR with age.

Table 3

| Age, Year | “Gidmed” Clinic | | “Mkurnali” Clinic | |
|-----------|-------------------|-------------------|-------------------|------------------|
| | Prevalence (%) | CFR Index | Prevalence (%) | CFR Index |
| 18-24 | 94% $n = 34$ | 8.74 ± 4.114 | 61% $n = 11$ | 2.55 ± 1.036 |
| 25-33 | 98,8% $n = 55$ | $11,60 \pm 4.93$ | 83% $n = 15$ | 3.13 ± 1.598 |
| 34-40 | 96% $n = 41$ | 14.31 ± 54.48 | 91.5% $n = 14$ | 3.25 ± 1.893 |
| | $p < 0.002$ | | $p < 0.542$ | |

It has to be mentioned that among studied patients only 2 (1.17%) were healthy, 11 (6.47%) had compensated form of caries, 29 (17%) had sub-compensated and 128 (75.3%) severe-decompensated form of caries.

Study of specifics of caries development in pregnant, showed defined difference in its manifestation, particularly, caries lesion on one surface was seen in $50 \pm 1.17\%$ cases, two – $32.5 \pm 1.1\%$ and three – $17.5 \pm 0.89\%$ cases. We consider this fact important, as such dynamics of high damage in pregnant women is characteristic to the region, population of which experience fluoride deficit in the water.

According to our studies, clinical specifics of decay process, particularly during late toxicosis of pregnancy, is an acute course, rapid spread not only on peripheries, but to the deepness and pulp of the tooth, which lead to short timelines for development of caries complications; and during stage of stain, enamel stiffness was assessed with probing.

Performed analysis of gestational period and age characteristics in pregnant women who addressed to the dental polyclinic from female consultation, helped to reveal that more or less frequently patients were visiting dentists below age of 25 year on an initial stage of pregnancy. With increase in the gestational term, CFR indicator increased, however maximal index was revealed in the end of second and beginning of the third trimester.

Hygienic condition of oral cavity (according to index OHI-S) in a high percentage of studied pregnant women, was unsatisfactory – mean 62.5%, which was worsening with increase in the term of pregnancy. Hygienic index varied between 2.2-2.6 points in almost half of the observed (48.6%).

As it is known, pregnancy – natural physiologic process, which shall not have a negative effect on the organism, but, unfortunately, due to different reasons, condition of teeth in this period is still worsening. Nausea, vomiting, change in eating habits and worsening of appetite, lead to calcium deficit, which is necessary for fetus, and baby starts taking it and as a result, dental health of mother is worsening.

Change in hormonal background, restructuring of all types of metabolism, including calcium, decrease in the protective forces of organism, change in the function of salivary glands – factors accompanying any pregnancy, at the same time represent the risk factors for developing dental diseases.

There are two reasons revealed during pregnancy causing dental problems: First - hormonal changes of the organism, second is the process of gestation itself, which requires transfer of important microelements from the mother, their deficit is conditioned by metabolic processes during pregnancy. Study of individual cards of pregnant women revealed that 23% of examined had not only deficit of calcium and phosphate but imbalance of these microelements (disturbance Ca/P), which was reflected on the condition of dental system of future mother; in 22% there was deficit in vitamin “D” and 12% - negative iron balance, which was causing iron deficiency anemia. Developing negative balance of iron, calcium, phosphorus, vitamin “D” and other vitamins during pregnancy, affected dental health of pregnant women and as a result severe – decompensated form of caries was diagnosed.

Thus, change in the hormonal background, restructuring all types of metabolism, including calcium, decrease in protective forces of organism, change in the function of salivary glands- these factors, accompanying any pregnancy, at the same time represent risk factors of developing dental diseases, especially for those living in Georgian regions, population who take fluoride deficit water.

Data of our study showed low level of dental health during period of pregnancy, which highlights the necessity for more detailed diagnostics of all risk factors of main dental diseases and realization of all stages of therapeutical-prophylactic measures during period of pregnancy based on the results of full complex examination, considering fluoride deficit situation in our region.

For increase in the level of dental health in pregnant women and getting maximal effect from the taken

anticaries measures the following are required: Therapeutical-prophylactic measures related to caries and its complications considering critical period of pregnancy; Conduct of individually oriented on sanitary-hygienic and dental education.

Conclusion

Pregnancy is a critical period for dental health in women and is characterized by the changes in the level and structure of oral cavity diseases. Currently dental diseases during pregnancy form separate link in cariesology and periodontology based on clinical particularities and effect of general condition of the organism. All these confirm the necessity of more detailed study of the reasons for worsening of dental status in pregnant women, moreover at this moment in Georgia there are no special prophylactic programs for dental diseases during period of pregnancy.

The aim of this study is to conduct situational analysis for diseases of dental hard tissues among pregnant women, allowing to perform active risk-factor monitoring for disease development, and to create science-based therapeutical-prophylactical programs considering critical period of pregnancy.

Study results show massive prevalence of dental caries among pregnant women and comprise 87.8% mean ($p < 0.002$) at intensity of 7,3 and was characterized by increase with age and term of gestation period. Among local risk factors inducing mineralization process of dental hard tissues in all trimesters of the pregnancy, most significant is unsatisfactory hygiene of oral cavity. Index OHI-S in 48.6% of cases comprised 2.2-2.6 points. Between all factors developing during pregnancy, the leading place was taken by negative iron (12%), calcium and phosphorus (23%) balance, vitamin "D" deficiency (22%).

Thus, data of our research showed low level of dental health during period of pregnancy, which highlights necessity for more detailed diagnostics of all risk factors for dental diseases and realization of all stages of therapeutical-prophylactical measures based on the results of full complex examination, considering fluoride deficit situation in Georgia.

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PEDAGOGICAL SCIENCES

UDC 371.121

LAST WILL AND TESTAMENT OF MANAS BATYR (Based on the material of the author's work by Mar Baidzhiev "The Legend of Manas")

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УДК 371.121

ПРЕДСМЕРТНОЕ ЗАВЕЩАНИЕ МАНАС-БАТЫРА (На материале авторского произведения Мара Байджиева «Сказание о Манасе»)

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Abstract

This research article discusses episodes related to how Khan Manas, who was seriously wounded in the great battle during the Great Campaign, was met by his wife Kanykey. Despite the severe pain in the area of the wound, Manas pulled himself together with all his strength to stand in front of Kanykey with dignity. The wise Kanykey immediately subtly felt the poor state of her husband. Having rested a little after returning from an exhausting long journey, Manas asked his wife to come up to him; he decided to tell her about his will, that his days were numbered and he had only a short time to live; he asked her to mature, grow stronger, live for the sake of a common son, take care of him, protect her son from haters in every possible way; he told her: "when our son grows up, tell him about his father, his life path and exploits; how he gathered and rallied the Kyrgyz family scattered in different places and distant lands into a single people, and that his father devoted his life to his native people; educate him so that he grows up as a hero, a defender of his land".

The will given to Kanykey was executed by her very reverently, accurately and responsibly. In the difficult days that fell to her lot, she gathered herself, pulled herself together, got stronger. Day and night, thinking about her son Semetey: she cared, educated, tried to make him grow up as a son of the people, a worthy successor to the legacy of his ancestors, and become a gentleman, perform heroic deeds like his father. Kanykey's mother looked into her son's future with great hope. And the son of Semetey, in turn, was a spiritual support for his mother. In the most difficult hours and minutes, she was supported and helped, the grandmother of her son Chiyrydy was next to her, as well as relatives on her mother's side. In her images, we see hidden spiritual values, an example to follow, which our Kyrgyz mothers need to follow in the modern information-saturated reality.

The article focuses on the fact that the testament as a method of public education carries a great moral value in the formation of important personal qualities of the younger generation.

Аннотация

В данной научной статье рассматриваются эпизоды, связанные с тем, как тяжело раненого в великом сражении в Большом походе Хан Манаса встретила его жена Каныкей. Несмотря на сильную боль в области раны, Манас изо всех сил собрался, чтобы достойно держаться перед ней. Мудрая Каныкей сразу же тонко прочувствовала неважное состояние мужа. Немного отдохнув после возвращения из изнуряющей далёкой дороги, Манас позвал к себе жену; он решил рассказать ей о своём завещании, о том, что его дни сочтены и ему осталось жить совсем недолго; он попросил её, чтобы она мужала, крепла, жила ради общего сына, проявляла заботу о нём, всячески оберегла сына от ненавистников; он сказал ей: «когда сын подрастёт, расскажи ему об отце, его жизненном пути и подвигах; как он собрал и сплотил разбросанный по разным местам и далёким краям кыргызский род в единый народ, и что его отец посвятил свою жизнь родному народу; воспитывай так, чтобы он рос героем, защитником своей земли».

Завещание, данное Каныкею было исполнено ею очень трепетно, аккуратно и ответственно. В тяжёлые дни, выпавшие на её долю, она собралась, взяла себя в руки, окрепла. Днём и ночью думала о сыне Семетее: заботилась, воспитывала, старалась, чтобы он рос сыном народа, достойным продолжателем наследия предков, и стал джигитом, совершал героические подвиги как его отец. Мать Каныкей с большой надеждой смотрела в будущее своего сына. А сын Семетей, в свою очередь, был духовной опорой для матери. В самые трудные часы и минуты, ей оказала поддержку и помощь, была рядом с ней бабушка сына Чыйырды, а также родня по линии матери. В её образе мы видим сокровенные духовные ценности, пример для подражания, которому необходимо следовать нашим кыргызским матерям в современной информационно перенасыщенной реальности.

В статье акцентируется внимание на том, что завещание как метод народного воспитания несёт в себе большую нравственную ценность в формировании важных личностных качеств подрастающего поколения.

Keywords: child, people, testament, method of education, fidelity, instruction, native land.

Ключевые слова: ребёнок, народ, завещание, метод воспитания, верность, наставление, родная земля.

Введение.

Наш народ вправе гордиться богатством и многообразием устного поэтического творчества, вершиной которого является эпос «Манас». Как один из древнейших кыргызских эпосов, «Манас» представляет собой наиболее полное и широкое художественное отображение многовековой борьбы кыргызского народа за свою независимость, за справедливость и счастливую жизнь.

Методы исследования: изучение научно-методической литературы и статей по теме исследования; анализ, синтез, сравнение, обобщение, оценивание, прогнозирование и другие.

Основное содержание.

Эпос «Манас» начинается с описания страшного народного бедствия, явившегося следствием вероломного нападения китайцев во главе с Алооке ханом на страну кыргызов. В такой критический момент в семье престарелого Джакыпа, сосланного из родных мест на далёкий Алтай к враждебным калмакам, рождается ребёнок, который растёт не по годам, а по дням, наливаясь сверхъестественной силой. Он собирает разбросанный кыргызский род в единый народ. Кыргызы вновь занимают свои земли на Тянь-Шане и Алае в результате победы над войсками Текес хана, Ахунбешим хана, Алооке хана и Шоорук хана. Но, в войне против китайских войск во главе с Конурбаем («Великий поход»), Манас возвращается смертельно раненым. И чувствуя свой конец, рассказывает свои завещания жене Каныкей.

Манас позвал к себе Каныкей, и, обняв её за плечи, сказал: «Мужайся, моя верная, кажется мой час приблизился. Береги себя для нашего сына. Когда я умру, ты беги в Бухару к своему отцу. Пусть Семетей растёт там. Здесь вы не увидите светлых дней; Абыке, Кобош не дадут вам спокойно жить».

Они:

И сына нашего они

В манкурта тут же превратят,

Заставят скот его пасти [1, С. 279].

Что его отец был Манас, его родина не Бухара, а Талас. Воспитай сына батыром. Потом он соберёт кыргызов, восстановить вновь наше единство. Похорони меня в горах; пусть никто не знает, кроме Бакая и дядушки Кошой. Если узнают все, враги из-за мести могут надругаться надо мной. Не забудь послать весть в Турфан, к калмакам. Я же обещал жениться на Кыз-Сайкал на том свете. Не хочу встречать смерть как дряхлеющий старик, в последний раз накрой меня одеждой брони Ак-олпок, мой безотказный ружьё Ак-келте положи рядом, на кереге повесь сумку Боз-кисе. Положи у изголовья мой булатный меч Зулпукор, справа от меня по-

ставь Сырнайзу, подай в правую руку мой любимый камчи. Так я буду встречать смерть как воин, раненный в бою!

Каныкей рыдая говорить: - Ты что, сына сиротой оставишь, а свой народ в беде; ох, нас горькая судьба ждёт. Но, взяв себя в руки, собрала верных джигитов. Ночью пошли в ущелье и пробили проход на каменной стене у скал, там и построили гроб для Манаса. Когда она вернулась, Манас попросил её позвать родных, друзей и воинов, чтобы взглянуть на них в последний раз. Все пришли сразу же, и окружили Манаса, чтобы отдать свой последний поклон. Когда все воины ушли, Манас снова позвал к себе жену и, прижав её ладонь к губам, отдал свою душу к небесам...

И весь народ тут зарыдал, Каныкей едва держалась на ногах; Кошой, Эр-Тоштюк, Бакай, Ажыбай, верные чоро Манаса, рыдали все. Было так темно, как будто солнце и луна затмились, даже казалось, что скалы рушились и даже земля дрожала. Верблюд Манаса Желмаян переклонил колено в слезах, у юрты, где лежал Манас. А пёс Манаса Кумайык не ел, не пил семь дней и по ночам жалобно скулил. Ак-Шумкар - сокол Манаса кружил, кружил над юртой, потом бесследно улетел в горы. А Тайбуурул - скакун Манаса хрипел, землю копытом бил, а в глазах дрожали слезы... Услышав весть о смерти Манаса, Кыз-Сайкал скончалась. Абыке, Кобош – братья Манаса стояли, пустив фальшивые слезы.

Ночью Бакай, Тоштюк и Кошой омыли тело Манаса, прочли молитву, потом тайно погребли в скалах, где заранее по завещанию Манаса приготовила Каныкей, и завалили вход камнями. Утром весь народ пришёл на похороны Манаса. Мудрый Бакай, тайно привёз - труп умершей старухи и, они похоронили её вместо Манаса. После похорон все уехали, пообещав собраться тут через год, чтобы помянуть Манаса. Когда после смерти Манаса едва прошла сорок дней, Абыке послал своих людей к Каныкей, чтобы совершить нике. Но, Каныкей отказала ему. Потом отправил своих людей Кобош. И ему отказала. После отказа Кобошу, Каныкей задумалась и убедилась, что все это не приведёт к добру. Вспомнив слова Манаса, решила сбежать к отцу; взяв сына, вместе с Чыйырды сбежали в Бухару. Вскоре из-за трона между Абыке и Кобошем вспыхнули войны.

Вышеуказанным понятиям, как «манкурт», «Ак-олпок», «Боз-кисе», «Сырнайза», «батыр», «камчы» и другим, автором произведения даются следующие толкования.

манкурт – потерявший память; не помнящий своего родства [1, С. 304].

ак-олпок – боевая верхняя одежда [1, С. 303].

боз-кисе – мешочек для огнива [1, С. 303].

сыр-найза – крашеное копье [1, С. 305].

батыр – воин, герой [1, С. 303].

камчы – нагайка, плётка [5, С. 336].

кереге – решетчатые стены юрты [1, С. 304].

нике – обряд бракосочетания [1, С. 305].

Чтобы не делать ошибку сейчас, в будущем, мы должны знать прошлую историю народа. В этом отношении эпос «Манас», как высочайшее духовное наследие кыргызского народа. Чтобы дальше правильно двигаться вперед, мы должны знать и «Манас» тоже. Это эпическое наследие, которое наши предки, несмотря на лишения и невзгоды, суровые условия бытия и жизненные бури кочевой жизни, не растеряли, сохранили и донесли до нас. Современная молодежь, прочитав эпос «Манас», может познакомиться с многовековой историей кыргызского народа, осмыслить уроки прошлого, получить сведения о богатейшей национальной культуре и духовных традициях. Возможность сохранить себя как полноценную нацию с самобытной культурой наряду с другими народами мира, напрямую связана с тем, насколько удастся каждому кыргызу сохранить в своем сердце идеи «Манаса», и бережно относиться к прошлому народа.

Заключение.

Обобщая вышеизложенное содержание, мы посчитали целесообразным сделать следующие выводы:

- в завещании отражено воспитательный урок о том, как матери необходимо проявлять заботу о своём ребёнке, расти, его воспитывать, чтобы он возмужал, стал опорой народа, защитником его, служил ему;

- говорится, что, когда подрастёт сын, первым делом нужно рассказать ему об отце, кем был он в жизни;

- даётся наставление, какие трудности, преграды ждут их в дальнейшей жизни; советы им, как их необходимо преодолевать; каждый джигит перед своим последним мигом должен задаться вопросом: - «... прожил ли я свою жизнь со смыслом?»;

- вся прожитая жизнь Хан Манаса ёмко заключена, на наш взгляд, в следующих строках, которые несут ценную воспитательную мысль:

«Я счастлив, перед смертью рад,

Что за кыргызский свой народ,

За честь и родину свою

Я жизнь, не дрогнув, отдаю» [1, С. 281].

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MODELING OF PROFESSIONAL PHYSICAL READINESS OF STUDENTS IN HIGHER EDUCATION INSTITUTIONS OF AGRICULTURAL PROFILE BY MEANS OF WRESTLING**Suchkov A.K.**

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[DOI: 10.5281/zenodo.7002901](https://doi.org/10.5281/zenodo.7002901)*

**МОДЕЛИРОВАНИЕ ПРОФЕССИОНАЛЬНОЙ ФИЗИЧЕСКОЙ ГОТОВНОСТИ
СТУДЕНТОВ В УЧРЕЖДЕНИЯХ ВЫСШЕГО ОБРАЗОВАНИЯ АГРАРНОГО
ПРОФИЛЯ СРЕДСТВАМИ СПОРТИВНОЙ БОРЬБЫ****Сучков А.К.**

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Abstract

The article provides a justification the choice of wrestling as a means to increase the level of physical readiness of students of higher education institutions of agricultural profile. The process of modeling professional physical readiness for the conditions of future production activity is presented. The author's development can also serve as an example for the training of students studying in specialties with other different conditions of production activity.

Аннотация

В статье дано обоснование выбора спортивной борьбы как средства для повышения уровня физической подготовленности студентов учреждений высшего образования аграрного профиля. Представлен процесс моделирования профессиональной физической готовности к условиям будущей производственной деятельности. Авторская разработка также может служить примером для подготовки студентов, обучающихся по специальностям с другими различными условиями производственной деятельности.

Keywords: students, institutions of higher education of agrarian profile, physical readiness, wrestling, priority physical qualities, endurance, force.

Ключевые слова: студенты, учреждение высшего образования аграрного профиля, физическая подготовленность, спортивная борьба, приоритетные физические качества, выносливость, сила.

Введение

Важным требованием к выпускникам учреждений высшего образования (УВО) является их физическая готовность к выполнению профессиональных функций, определяемая уровнем физической подготовленности (УФП). Физическая подготовленность является результатом подготовки не к труду вообще, а к конкретной трудовой деятельности. Исходя из этого, для каждой профессиональной деятельности необходимо определять соотношения компонентов как в комплексе «физическая подготовленность» (состояние здоровья, умения и навыки, физические качества), так и в ее составляющей «физические качества». Определение такого соотношения в процессе моделирования физической готовности специалиста в зависимости от специфики его будущей профессиональной деятельности, функционального состояния, телесной развитости, возраста, пола, двигательной активности, среды обитания, других возможных внешних и внутренних факторов и будет характеризовать его физическую подготовленность к профессиональной деятельности. Таким образом, в формировании физической подготовленности приоритет следует

отдавать направленному совершенствованию тех физических качеств, к которым условия будущей профессиональной деятельности предъявляют повышенные требования. В связи с этим Л.П. Матвеев отмечает, что «Конкретизация же задач в рамках профессионально-прикладной разновидности физического воспитания происходит применительно к потребности обеспечить специализированную физическую подготовленность к избранной индивидуом профессиональной деятельности, гарантировав развитие физических качеств и сопряженных с ними способностей, необходимых для результативности данной деятельности и позволяющих в случае неблагоприятных условий труда противостоять их негативному воздействию» [1, с. 131]. Для студентов учреждений высшего образования (УВО) аграрного профиля это положение имеет особое значение в связи с необходимостью учета неблагоприятных погодных условий, нестабильного рабочего графика, вредных производственных условий, определенной доли ручного труда в предстоящей трудовой деятельности [2].

Методы исследования

Для исследования проблем достижения профессиональной физической готовности студентов в учреждениях высшего образования аграрного профиля мы использовали следующие методы: анализ и синтез, опрос (анкетирование, беседы), педагогическое наблюдение, педагогическое моделирование, педагогическое тестирование, математическая обработка полученных данных.

Результаты исследования

В ходе наших лонгитюдных исследований (с 2007 г. по н.в.) мы изучаем условия будущей про-

фессиональной деятельности студентов УВО аграрного профиля. Анализ документов, наблюдения за практиками студентов, анкетирование выпускников, беседы со специалистами агропромышленного комплекса (АПК) показали, что, как и в прошлые годы, современным специалистам этой отрасли требуется достаточно высокий уровень развития физических качеств, а приоритеты расставлены следующим образом (рис. 1).

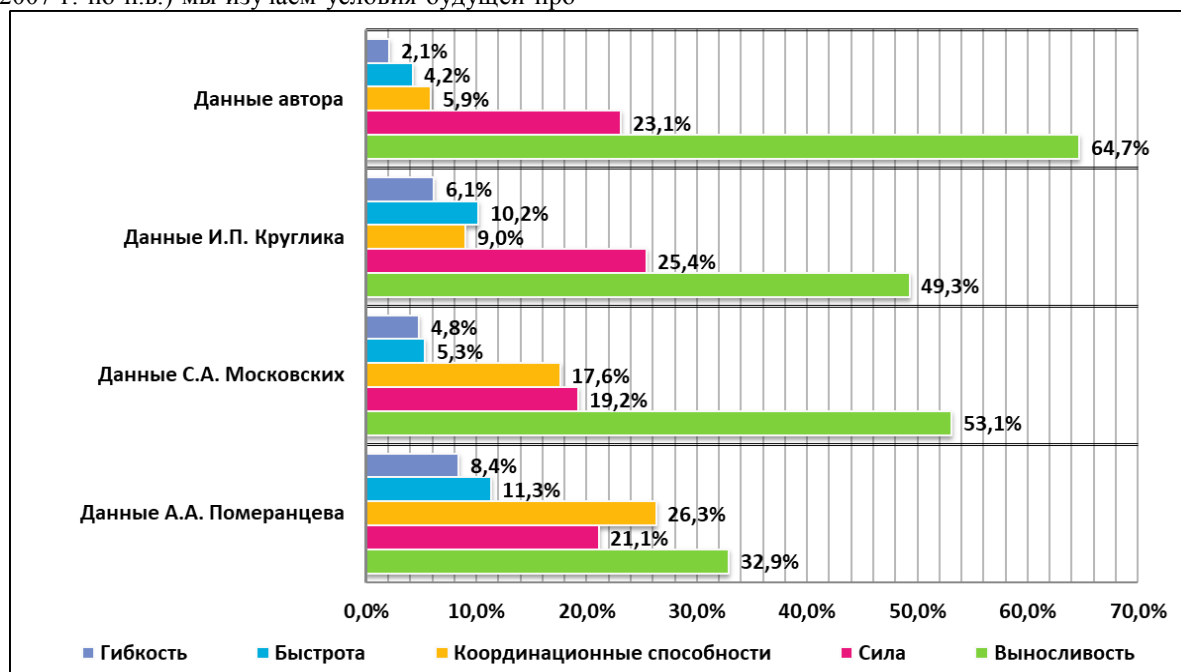


Рис. 1. Диаграммы удельного веса физических качеств работников сельского хозяйства

Исследователи разных лет – А. А. Померанцев (1986), С. А. Московских, Н. Г. Деминцев (1986), И. П. Круглик (1988) и А. К. Сучков (2003–2007) [3] указывают, что наиболее важными физическими качествами для успешной работы в сельском хозяйстве являются выносливость, а также сила. Сопоставим приведенные на рисунке 1 полученные данные прошлых лет с результатами проведенного нами в 2021 г. опроса студентов ($n = 1697$) УВО «Витебская ордена «Знак Почета» государственная

академия ветеринарной медицины» (ВГАВМ). Цель опроса – совершенствование подготовки студентов для обеспечения их физической подготовленности к условиям будущей профессиональной деятельности. Какие же физические качества, по мнению студентов, являются для них наиболее профессионально значимыми? Анализ ответов респондентов позволил следующим образом расставить приоритеты (рис. 2).

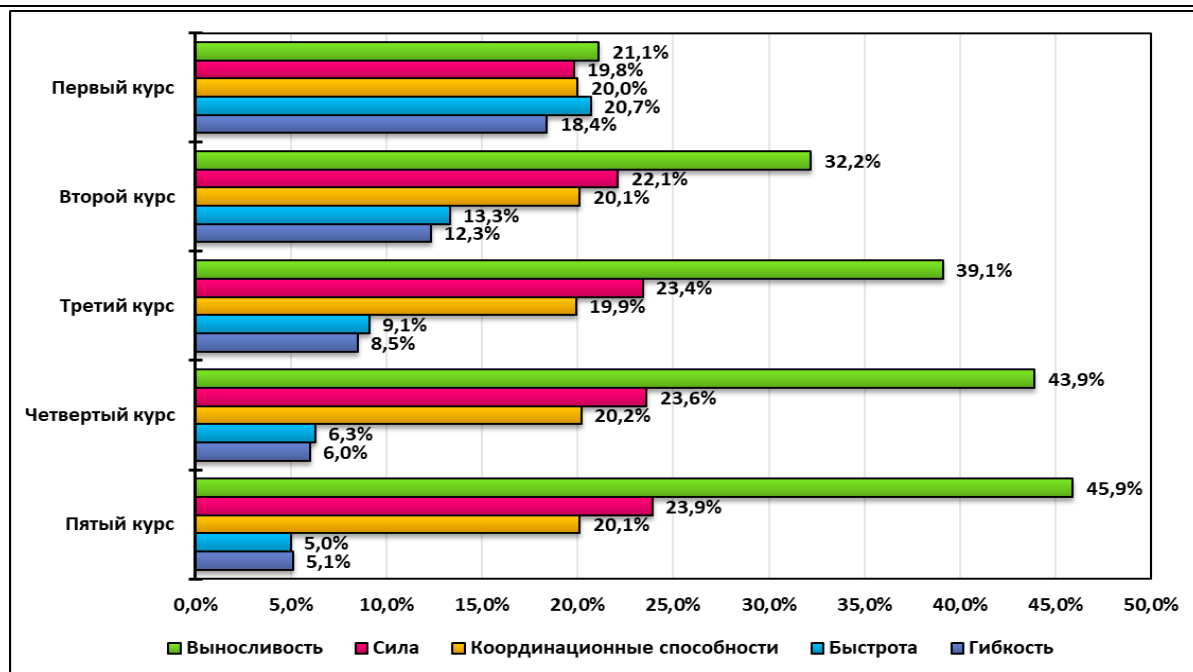


Рис. 2. Результаты опроса студентов УВО ВГАВМ

Обобщенные результаты опроса показывают, что студенты первого курса не вполне четко представляют, какие из физических качеств являются для них наиболее профессионально значимыми. К пятому курсу студенты накопили определенный опыт, приобрели теоретические знания, освоили практические умения, необходимые для их будущей профессиональной деятельности. Их мнения согласуются с мнением приведенных выше авторов о приоритетности выносливости, а также силы. Это следует учитывать при организации профессионально направленных занятий по формированию физической подготовленности студентов. Однако, побуждение к действию, основанное только на внешнем предписании (прямой способ воздействия), а в случае отклонения от заданного предписания – применение санкций, как правило, не всегда эффективно. Как показывает практика, средства физического воспитания для развития профессионально значимых физических качеств не всегда бывают востребованы студентами по разным причинам, а тренировочные средства популярных в студенческой среде видов спорта, как правило, не ориентированы на достижение профессиональной физической пригодности будущих специалистов. Вследствие этого мотивация к профессионально направленным занятиям снижается, что наряду с экологической обстановкой, низкой двигательной активностью современной молодежи, другими объективными и субъективными факторами может являться причиной отрицательной динамики УФП студентов.

Одним из решений указанной проблемы будет моделирование профессионально направленной и лично ориентированной подготовки по обеспечению физической готовности студентов к предстоящей профессиональной деятельности. Содержа-

ние такой подготовки состоит из разделов подготовки по спортивной борьбе, востребованному у студентов виду спорта, что согласно приоритетному принципу образования – принципу гуманизации, обуславливает лично ориентированную направленность физического воспитания. Структура же подчинена решению задач приоритетного развития выносливости и силы – профессионально значимых физических качеств студентов УВО аграрного профиля, что согласно принципу компетентностного подхода, обеспечивает его профессиональную направленность, практикоориентированность.

Для интеграции указанных направлений образовательного процесса нами разработана методика повышения УФП студентов. Цель методики – *обеспечить эффективное повышение уровня физической подготовленности студентов средствами спортивной борьбы на основе приоритетного развития выносливости и силы.*

Для реализации методики мы моделируем следующие компоненты: учет образовательной специфики УВО, кадровое обеспечение, востребованность у студентов, возможность эффективно совершенствовать выносливость и силу. Методика предполагает совершенствование выносливости: на 1-м этапе (в начале учебного семестра) – средствами циклических видов спорта, методом стандартно-непрерывного упражнения; на 2-м этапе (в основной части учебного семестра) – средствами спортивной борьбы и игровых видов спорта, интервальным методом с напряженными интервалами отдыха; на 3-м этапе (в конце учебного семестра) – средствами циклических видов спорта, повторным, переменным методами. Пример моделирования параметров тренировочных нагрузок приведен в таблице 1.

Таблица 1.

Фрагмент методической карты развития выносливости

| Периоды | | Основной метод тренировки | Тренировочные средства | Дозировка на одном занятии | Интенсивность, ЧСС |
|-------------|------------|------------------------------------|------------------------|----------------------------|--------------------|
| 1-й семестр | Сентябрь | Стандартно-непрерывного упражнения | Кросс | 15–20 мин | 130–140 уд/мин |
| | | | Спортивные игры | 15–20 мин | 120–150 уд/мин |
| | | | Борьба | 30 мин | 120–140 уд/мин |
| | Октябрь | Интервальный | Спортивные игры | 15–20 мин | 140–160 уд/мин |
| | | | Борьба | 50 мин | 130–150 уд/мин |
| | Ноябрь | Интервальный | Спортивные игры | 15–20 мин | 140–160 уд/мин |
| | | | Борьба | 50 мин | 130–150 уд/мин |
| Декабрь | Переменный | Лыжи | 40 мин | 130–150 уд/мин | |

Средствами развития силы являлись упражнения специальной физической и общей физической подготовки борцов (пример моделирования – таблица 2).

Таблица 2.

Фрагмент методической карты развития силы

| Краткое описание упражнения | Метод тренировки | Дозировка на одном занятии и периодичность | | |
|---|--|--|---------------------------|---------------------------|
| | | 1-й год | 2-й год | 3-й год |
| 1 | 2 | 3 | 4 | 5 |
| 1. Лазание по канату без помощи ног | Стандартно-повторного интервального упражнения | 2 повт. 1 раз в неделю | 3 повт. 1 раз в неделю | 4 повт. 1 раз в неделю |
| 2. Силовые упражнения на борцовском мосту | Сопряженного упражнения | 2×30 с 2 раза в неделю | 2×45 с 2 раза в неделю | 2×60 с 2 раза в неделю |
| 3. Подъем партнера из высокого партера обратным захватом туловища | Сопряженного упражнения | 4 повт. 1 раз в неделю | 5 повт. 1 раз в неделю | 6 повт. 1 раз в неделю |
| 4. Теснения партнера | Сопряженного упражнения | 3×30 с 2 раза в неделю | 3×45 с 2 раза в неделю | 3×60 с 2 раза в неделю |

Авторская методика является главной практической составляющей модели формирования профессиональной физической готовности студентов в учреждениях высшего образования аграрного профиля средствами спортивной борьбы (рис. 3). Ее значимость обуславливается тем, что целью подго-

товки по спортивной борьбе является не достижение спортивного результата, а повышение УФП обучающихся. Виды борьбы, являясь популярными, востребованными у молодежи [4] служат фактором мотивации к организованным в УВО профессионально ориентированным учебно-тренировочным занятиям.

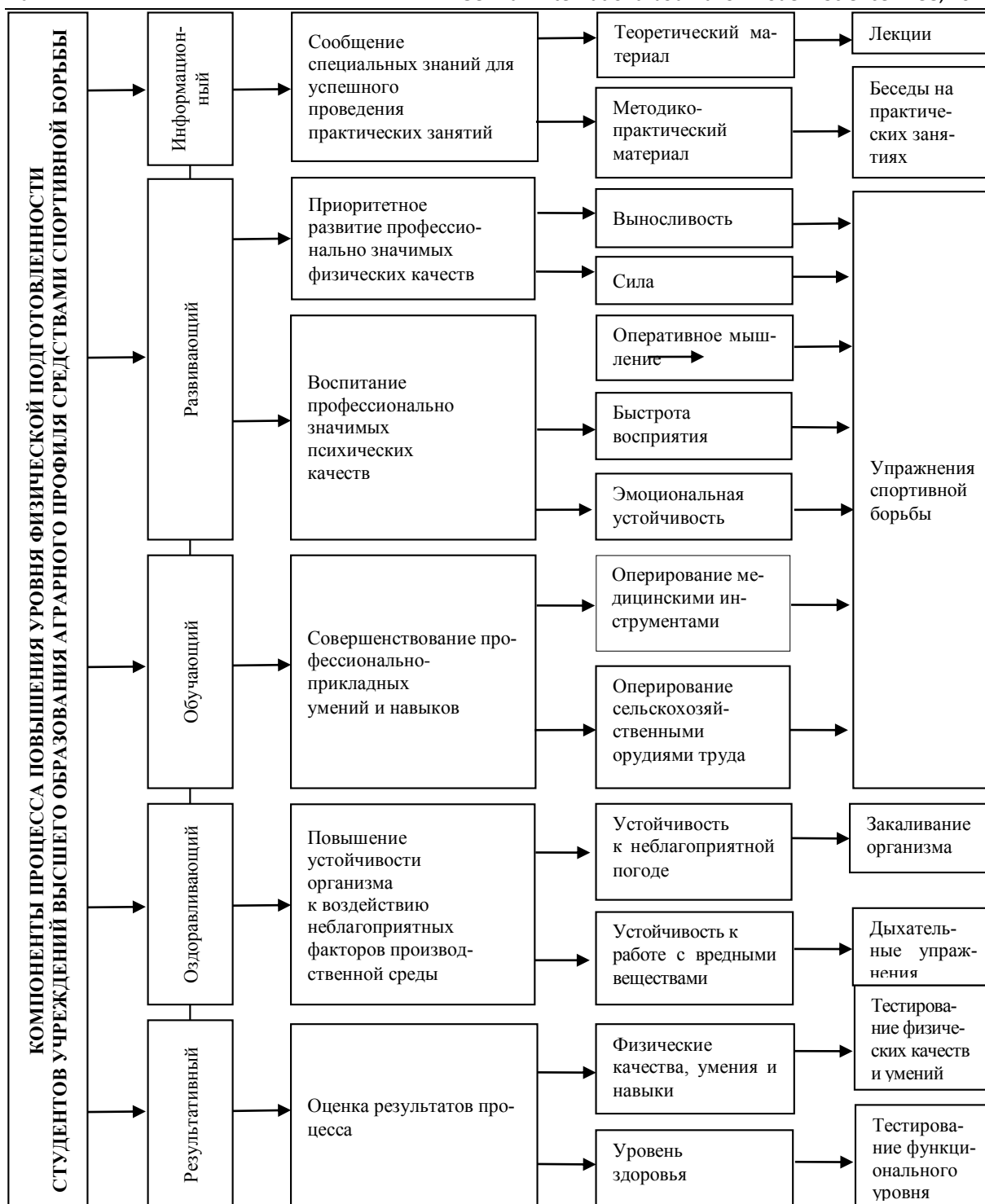


Рис. 3. Модель формирования профессиональной физической готовности студентов

Заключение

О состоятельности модели говорят результаты ежегодно проводимых на кафедре физического воспитания и спорта УВО ВГАВМ тестирований УФП студентов. По данным статистического анализа на 1-м курсе оценки УФП студентов (за исключением имеющих 1 спортивный разряд и выше), различаются несущественно, по случайным причинам. На 2-м, 3-м и 4-м курсах наблюдаются статистически значимые различия оценок УФП студентов разных групп. Более высокие показатели отмечены в группах, занимающихся по авторской методике, являю-

щейся составляющей частью модели формирования профессиональной физической готовности студентов.

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CRITICAL THINKING AS A MEANS OF THINKING AND LEARNING TECHNOLOGY

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[DOI: 10.5281/zenodo.7002913](https://doi.org/10.5281/zenodo.7002913)

КРИТИЧНЕ МИСЛЕННЯ ЯК ЗАСІБ МИСЛЕННЯ ТА ТЕХНОЛОГІЯ НАВЧАННЯ

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Abstract

The development of society is possible thanks to development of each its representatives. On the other hand, society demands regarding the level of education and awareness of its members. The information society, in which we now are functioning and developing, also has its own demands. Among the leading skills that are in demand, critical thinking occupies special place. The development of critical thinking is a long and planned process, therefore it involves using of certain methods and techniques.

Анотація

Розвиток суспільства можливий за умов розвитку кожного її представника. З іншого боку суспільство висуває вимоги щодо рівня освіченості та обізнаності його членів. Інформаційне суспільство, в якому ми зараз функціонуємо та розвиваємось також висуває свої вимоги. Серед провідних навичок, які ним затребувані, особливе місце займає критичне мислення. Розвиток критичного мислення – процес тривалий та планомірний, тому передбачає застосування певних методів та прийомів.

Keywords: critical thinking, scientific thinking, development technology, educational process

Ключові слова: критичне мислення, наукове мислення, технологія розвитку, освітній процес.

Процеси, які відбуваються у сучасному суспільстві, характеризуються динамічністю, мінливістю та невизначеністю. Невід'ємною складовою процесу прийняття рішень у будь-якій сфері є інформаційна складова. Перевагу надають тим фахівцям, які демонструють розвинуті, перш за все, софт-скілс, серед яких провідну роль займає критичне мислення.

Мислення – це один з тих психологічних процесів, який супроводжує всі розумові процеси людини. Саме здатність мислити, а не запам'ятовувати, репродукувати чи накопичувати знання дає перевагу в сучасному інформаційному суспільстві.

Актуальність необхідності вміння працювати з інформацією, критично її обробляти та усвідомлювати обумовлена низкою причиною: збільшенням ролі інформації і знань у житті суспільства (при чому не сукупністю знань, які характеризуються рівнем IQ, а можливістю користуватися та змінювати наявні знання та інформацію); створенням глобального інформаційного простору, який поєднує людей, ресурси, техніку та технологію (розширення нетворкінга, розвинення е-навчання, е-лідерства тощо).

Крім того, постійна зацікавленість даним питанням науковців та практиків, підтверджує її актуальність. Так, принципи та закономірності функціонування критичного мислення були фокусом дослідження таких науковців як: В. Біблер, Т. Бізенков, П. Блонський, А. Болотов, Д. Вількеєв, Дж. Гілфорд, І. Ільясов, З. Калмикова, І. Лернер, О. Матюшкін, С. Рубінштейн, Д. Стіл, О. Тихомиров, А. Фачоне, В. Шубинський тощо. Вивченню, обґрунтуванню та узагальненню методів розвитку критичного мислення присвятили свої роботи Ш. Амонашвілі, А. Байрамов, Т. Бізенкова, Б. Блум, С. Векслер, М. Верті, Д. Джумалієва, Дж. Дьюї, В. Казаков, В. Конєва, В. Крутецький, Г. Липкіна, Р. Маєр, Ф. Мінкіна, Л. Рибак, В. Сухомлинський та інші.

Незважаючи на зростаючу кількість наукових праць, виклики сьогодення вимагають уточнення як самого розуміння поняття «критичне мислення», так і зміни у підходах організації навчальних занять, спонукаючи викладачів все активніше впроваджувати технології розвитку критичного мислення в освітньому процесі.

Метою даної роботи є визначення особливостей та значення критичного мислення в інформаційному суспільстві, узагальнення технологій розвитку критичного мислення, які можуть бути використані в освітньому процесі.

Перш за все, зосередим увагу на визначенні та структурі критичного мислення як провідної софт-скілс. З цієї точки зору критичне мислення характеризується як науковий тип мислення [2,3,4], система суджень [5,6], процес, який передбачає роботу з інформацією [1,7,8], сума знань та вмінь [1,8].

Вважаємо, розглядати критичне мислення як суму знань недостатньо, тому що у зростаючому потоці інформації знання швидко з'являються і зни-

кають. Критичне мислення ґрунтується на логічному, абстрактному, предметному, а, отже, науковому мисленні. Але його відмінністю є спроможність виходити «за межі», проявляти креативність та нестандартність підходів вирішення ситуацій.

Ознаками критичного мислення науковці називають усвідомленість, самостійність, рефлексивність, цілеспрямованість, обґрунтованість, контрольованість, самоорганізованість.

Головна мета застосування критичного мислення – це прийняття рішень [3,4,6,7,8]. При чому важливо, що рішення приймаються зважено, оцінюючи різні альтернативи та аналізуючи наслідки як прийняття, так і не прийняття його.

Аналізуючи роботи науковців [1,2,4,5,8], можна узагальнити основні компоненти або дії, які слід виконувати задля критичного аналізу та усвідомлення інформації.

Вважаємо, що вони заслуговують більш глибокого аналізу, оскільки вимагають формування тих навичок, які повинні набути та довести до рівня компетентності здобувачі освіти.

Відправною точкою критичного мислення можна вважати спостереження. Спостережливі люди можуть швидко відчутти та визначити нову проблему. Ті, хто вміє спостерігати, також здатні зрозуміти, чому щось може бути проблемою. На основі свого досвіду вони можуть передбачити, коли проблема може виникнути, перш ніж вона з'явиться.

Коли проблема визначена та визнана, на перший план виходять аналітичні навички. Здатність аналізувати та ефективно оцінювати ситуацію передбачає знання того, які факти, дані чи інформація про проблему важливі. Це також часто включає проведення неупереджених досліджень, постановку релевантних запитань щодо даних, щоб переконатися, що вони точні і дають об'єктивну оцінку процесам, що відбуваються.

На основі аналізу робляться висновки. Вміння робити узагальнення та обґрунтування – це навичка, яка передбачає формулювання висновків щодо інформації, яка збиралась та досліджувалась. Це може вимагати додаткових технічних або галузевих знань чи досвіду. Зробити висновок означає знайти відповіді з урахуванням обмеженості ресурсів (інформація, час, інші ресурси).

Середовище, в якому приймається рішення передбачає наявність соціальних зв'язків, обмін даними, а, отже, комунікацію. Тому, в процесі критичного мислення комунікативні навички важливі, коли приходить час пояснювати та обговорювати проблеми та їх можливі рішення з колегами та іншими зацікавленими сторонами.

Процес прийняття рішень можна вважати успішним за умов реалізації цього рішення. Вирішення проблем часто вимагає критичного мислення, щоб реалізувати найкраще рішення та зрозуміти чи відповідає воно встановленій меті.

Вважаємо, що доцільність набуття навичок критичного мислення можна представити за допомогою квадрату Декарта (табл. 1).

Таблиця 1

| Навички критичного мислення на основі квадрату Декарта | |
|---|---|
| 1 | 2 |
| Що буде, якщо це відбудеться? | Що буде, якщо це не відбудеться? |
| 1. Будете менш вразливі до провокаційної інформації. 2. Зможете аналізувати, відбирати репрезентативну та відсіювати зайву інформацію, розрізняти дезінформацію. 3. Зможете зберігати «холодний розум» в різних ситуаціях, що дає змогу приймати зважені рішення та чітко аргументувати свою точку зору. 4. Створювати нові продукти (послуги), тим самим мати конкурентну перевагу. Демонструвати свою гнучкість та відкритість до змін. | 1. Не потрібно перенапружувати свій мозок, вдаючись до аналізу. 2. Завжди знайдеться тема для обговорення. 3. Можна використовувати чийсь рішення та підходи. 4. Економія часу на процеси збору інформації, аналізу, обґрунтування тощо. |
| Чого не буде, якщо це відбудеться? | Чого не буде, якщо це не відбудеться? |
| 1. Не буде великого емоційного збудження, оскільки ви будете усвідомлювати інформацію. | 1. Не зможете захистити себе від негативного впливу інформації. |

Продовження табл. 1

| 1 | 2 |
|---|--|
| 2. Не буде великого емоційного збудження, оскільки ви будете усвідомлювати інформацію. 3. Не будете піддаватися маніпуляціям з боку інших. 4. Не буде високого рівня довіри до інформації та подій. | 2. Не зможете орієнтуватися в інформаційному просторі (а, отже, часто можете бути жертвою маніпуляції та негативної пропаганди). 3. Не зможете вирішувати питання нестандартним способом (а, отже, взагалі прагнути до розвитку та вдосконалення) |

Аналізуючи табл. 1 можна зробити висновок про доцільність набуття навичок критичного мислення. При цьому слід зауважити, що це процес, який вимагатиме системності, завзятості, уважності, творчості тощо.

Педагогічною наукою та практикою вироблена технологія розвитку критичного мислення, яка вимагає виокремлення таких етапів проведення заняття: виклик, осмислення, рефлексія [9,10].

Кожний з цих етапів передбачає застосування певних методів та прийомів, що спонукають до творчого пошуку, дослідницької діяльності, прояву креативності тощо. Узагальнення досвіду застосування різних методів за зазначеними етапами наведено в табл. 2.

Слід зазначити, що само по собі застосування того чи іншого методу, не говорить про набуття навичок критичного мислення. Важливу роль відіграють актуальність та відповідність завдань та проблемних ситуацій, які вирішуються за допомогою перерахованих методів. Крім того, важливе комбінування методів та експериментування самим викладачем. Наприклад, реалізація мозкового штурму може реалізовуватися різними способами. Як показує практика зворотний брейнсторм дає більше цікавих ідей, ніж прямий. Таксономія Блума дає цікаве поєднання з Колесом життєвого балансу, а SWOT-аналіз інтегрується із SMART-технологією у технології GROW.

Таблиця 2

| Методи розвитку критичного мислення | |
|-------------------------------------|---|
| Етапи навчального заняття | Методи розвитку критичного мислення |
| Виклик | Кластер, асоціативний куш, дерево передбачень, таблиця «Знаю, хочу, вмію», мозковий штурм, робота в парах, кошик ідей, правильні не правильні судження, діаграма Венна, INSERT, Ромашка (куб) Блума |
| Осмислення | Ажурна пилка, дискусія, «тонкі» і «товсті» запитання, Т-таблиця, навчаючи вчуся, асоціативний куш, mind-map, діаграма Іскава, метод 6 капелюхів, метод вигаданих персонажів, метод синектики, метод фокальних груп, проектний метод, світове кафе, метод шестикутників, метод сценаріїв, метод Уолта Діснея, 323, презентація з помилками, дерево цілей, мозковий штурм, бріколаж, Ромашка (куб) Блума, RAFT-технології, метод номінальних груп, метод Дельфі, SWOT-аналіз |
| Рефлексія | Сенкан, кластер, таблиця «Знаю, хочу, вмію», ПІЕС, INSERT, Ромашка (куб) Блума |

Критичне мислення є основою для процесу прийняття рішення. Однак є ще інші навички, які слід враховувати під час розвитку критичного мислення: метакогнітивні навички, навички індуктивного міркування, креативні навички, навички концептуального мислення тощо, що і є предметом подальших досліджень.

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PHILOLOGICAL SCIENCES

LINGUOSTYLISTIC MEANS OF CREATING AN IMAGE

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[DOI: 10.5281/zenodo.7002923](https://doi.org/10.5281/zenodo.7002923)

Abstract

The paper deals with the linguistic aspect of a film title. It examines the role and functions of the title. It also analyses the models of mass communication, their productivity. The paper makes references to the history of development film industry in the context of a film title evolution.

Keywords: film industry, film title, means of expressiveness, nominativity, semantic nature, paratext.

The role of the film industry plays a big role in popular culture these days. Every year, many films are released worldwide, their main task is to convey the author's unique point of view, which he reveals by demonstrating the experiences or exposing a social problem. Films should attract the viewer with the opportunity to have fun or gain some new knowledge in a particular area, as well as inspire the audience. Watching foreign films, the viewer gets the opportunity to learn something new about another ethnic group and the countries in which they live, trace their culture and understand the mentality of these nationalities or races.

In our opinion, the title plays one of the main roles in understanding of the film. It is also important to understand the information embedded in the film, such interaction with the viewer is possible only with the correct translation of the title of the film. Therefore, we can conclude that the translator should be as focused as possible when translating the film title. [1]

What is the film title supposed to reflect? The most important feature that the title should reveal the individuality of the film, which contributes to the promotion of the film among other works. The titles no longer contain dry theses. These "privileges" were left to the press. Turning to the review of film titles, we would like to remind that most of the texts of the Middle Ages were named after the main character or contained his name in the title. The title could also reflect its content. There were also cases where titles were assigned later as a simple text identifier. We can say that the titles of books began to appear more as a sales tool. But the very concept of "headline" appeared around the dawn of the 1550s, when new means of communication were born (leaflets with religious propaganda, brief essays on incidents and disasters) - all that we can get these days using the media. It was during this period of time that the concept of the headline was born, which should convey to the listener, viewer and reader the main idea contained in the text. Because of this, such a phenomenon as headlines appeared, which were supposed to "speak" for themselves and give a complete picture of themselves. The importance of the headlines increased when the press moved to periodicals and the original text was changed. So, in comparison with the initial stage, the role of headings has increased, because the separation of information has become more convenient

and there are more and more subheadings. Jean Pierre Ségur noted in his essay that the titles of the books were simple and concise annotations. [2]

Because of the new organization, the use of headings has become a mandatory item in translation activities. At this time, lists of actors also appeared, which were presented in the form of maps and photographs, and after which they were included in the film. Such images showed the replicas of the actors, we can say that these were subtitles, but a more extended version. As cinema developed, titles began to be added, but only after the advent of sound in cinema. The titles began to function as a transition, they also began to show the name of the director and introduced a hierarchy of actors. During this period, the titles of films ceased to be kept within the framework of pragmatic communication and began to turn into plots that set the mood, as well as the visual character of the film.

The next aspect that we would like to highlight is the model of mass communication. Over the years, the titles of films have changed, mainly influenced by the way the film was processed and the analysis of the audio sequence. As a result, three different models of communication have emerged:

1) editorial - this is the production of individual items (text materials, books, disks and film media), which are sold as separate items. It is worth noting that they all have a long service life.

2) written - this type of model implies periodic and regular publication (newspapers and magazines). Each new release makes the previous one obsolete. [3]

3) streaming - characterized by a certain timing (transmissions on television and radio). As in the previous paragraph, the product of this model becomes obsolete after the release of a new one.

It is worth noting that for each such model there corresponds a certain plan from the economic side, as well as an organized distribution of responsibilities. Often, the productivity of these models is increased by a combination of several, for example: the distribution of film production on television or the serial publication of books. It is worth clarifying that the streaming model appeared only in 1920, and the rest originate in the first half of the 17th century. According to John Ellis, one can understand that these models were slowly formed within the framework of an unstructured market, and

only at the beginning of the 19th century did the models begin to overlap with each other. Each of these systems found its echo in the creation of headings and subheadings. An innovation of the time was the use of headlines in newspapers.

By the end of the 19th century, the film industry was already rapidly gaining momentum, and already in 1895 two models were distinguished by analogy: the editorial model and the informational one. But these days, we don't share our idea of a film as a piece of work. Consequently, we can conclude that the title of the film may look like the title of a book (many films are based on novels and bear their names). But in those years, it was never known what the title of the film would be and how it would be distributed.

What is a movie title? The title of a film is a parent text, which means one or more texts, not including the main text. Finn Frandsen argued that the paratext should include such concepts as: title, notes, attribution, abstract and title. Film production and paratext use different media. In cinema, the paratext can be reduced to the simplest expressions, but on television, the importance of linguistic and visual paratext is growing due to great competition. The viewer, the reader must go through the primal text only in order to understand the idea correctly. But often this theory is not confirmed, and the viewer is not very interested in the original text, and when he sees it on the screen, he usually switches the channel. [4]

Nowadays, film production is one of the largest entertainment industries; every day millions of viewers watch multiple television series and other television projects. It is worth noting that when broadcast on television, the film retains its original title and does not change it with each series. John Ellis noted that There is a bad way of arranging movie titles when the title uses a noun and an associated index, a scheme commonly used in talk show and entertainment programming. The streaming model assumes that no one will remember the content after the movie has been broadcast.

Now I would like to consider the functions of movie titles. Dirk Delabasti said: "The main function is to define. Without the initial identification, we would not be able to talk about the film, promotion would be impossible, and analysis of the film would be impossible. If a text comes to us without a title, we must give it a title in order to talk about it. So you can draw an analogy with computer files, where if the file already exists, it gets the same name, but with a serial number. It should be borne in mind that nominativity is the most obvious function of the name, it is worth highlighting the other functions:

- The title guides us through the flow of media information.
- The title is a means of interpreting the text, shows a certain point of view and briefly summarizes the film.
- The main function of the name of a film production can be its promotion, in which case the name should be easy to remember.

It can be assumed that the titles of the films should be different from the title of the novel or drama, but,

unfortunately, there are a small number of original film titles. In his work, Dirk Delabastia described the fact that the combination of different media or channels of communication in one text does not have any meaning. Therefore, more

number of movie titles will be able to work as novel titles and vice versa.

The work on the translation of the title of the film is very interesting, it can be viewed from different angles: the audience receives a huge number of translated works in various forms of translations, which have been previously reported. Multiple observations lead us to the conclusion that the titles of modern film production often appear in a bilingual version.

Working on the translation of movie titles shows us a concrete analysis of the object. The main thing in the work of a translator is to trace the adequacy of the title of the translated and the original.

The next method of translation of the name can be distinguished - the adaptive method of translation, i.e. we return to the original source, with such a translation the translated name corresponds to the name of the source. Therefore, we can conclude that when analyzing the translations of titles into Russian, we have different options, as the translation work makes us understand that translations of titles often use already fixed adaptation strategies.

It is worth noting that the translation of film titles is referred to as the translation of fiction. I would like to highlight the main transformations that are used in the translation of texts, they can also be applied to the translation of film titles.

Interlingual transformations - the transition from the lexical unit of the original to the units of translation. Such changes are formal-semantic in nature.

These techniques can be considered not only as a means of analyzing the dependencies between the dictionary equivalents of a foreign language and their counterparts in the translated language. Depending on the initial composition of the name, translation transformations are divided into lexical and grammatical, while both of these aspects are considered as a whole or passing from one to another.

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PHILOSOPHICAL SCIENCES

“CATASTROPHE NOISE” AS (1) A NECESSARY CONDITION FOR THE SURVIVAL OF CIVILIZATION AND (2) AN UNREMOVABLE THREAT TO ITS EXISTENCE

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Abstract

The paper discusses the fundamental contradiction of evolution. On the one hand, evolution laws require sociums to develop, the termination of the development leads to sociums' death (“social production can exist only as expanded reproduction”). On the other hand, catastrophes (and stressful situations in general) are a driving force for development, because they stimulate evolutionary self-assemblies. That is why “catastrophe noise” is always present in the life of sociums. However, if its level is significantly higher or lower than some optimal level, the socium degrades and then perishes. To ensure their survival, sociums create special mechanisms – war, market, and science, which generate “catastrophe noise”. But sociums are not able to maintain “catastrophe noise” at an optimal level which, in principle, is incalculable. Because of the unremovable imperfection of the controlling of its “catastrophe noise”, civilization will sooner or later perish due to it, if it does not perish earlier from catastrophes of external origin.

Keywords: “catastrophe noise”, evolution, “effect of shaking” evolutionary systems, socium, civilization, war, market, science, professional defects of scientists.

Although Charles Darwin's theory has contributed most to the spread of evolutionary ideas generally accepted in science today, the specific mechanism he proposed for the emergence of evolutionary innovations – the mechanism of natural selection – should be recognized as untenable. The autogenetic concept, which assumes that evolution occurs as a result of the self-organization of matter, is becoming increasingly widespread today.

Note that the autogenetic concept has much deeper roots than the theory of natural selection. The origin of the idea on the self-moving force of interactions (matter) is lost in the haze of ages. The early evolutionists were spontaneous autogeneticists; they spoke of the self-development of matter carried out by means of natural forces. For example, René Descartes wrote about laws of nature that would be sufficient to make the parts of matter unravel and arrange themselves very orderly. Clearly, laws alone cannot move anything, everything is moved by forces, or interactions, the laws of which Descartes called the laws of nature, directly referring to gravitation. The evolutionary views of I. Newton, I. Kant, P. Laplace, E. Darwin, R. Chambers, and others were of a similar nature. The following section summarises in five points the main propositions of the author's version of this concept [1].

The outlines of an autogenetic evolutionary concept

1. **The autogenetic idea.** Following the autogenetic tradition, we believe that universal evolution, i.e. inorganic, organic, and social evolution considered in a unified way, is the result of the self-organisation of matter (interactions).

2. **Vector of evolution.** Evolution takes place in a certain direction; its vector has several components:

- increase of complexity;

- increase of diversity;
- intensification of interactions;
- intensification of cycles;
- increase in the connectedness of “everything to everything”;
- growth of systems openness (increasing role of interaction with the environment); etc.

These components are common to universal evolution on the whole. Material systems must evolve, i.e. change along the vector of evolution, otherwise they degenerate and perish: “He in whose life there is no change, perishes by it. “Dead” is that which cannot change on its own anymore” [2]. In the evolutionary competition, the systems that are more successful in directing their actions along the vector of evolution win each time and, accordingly, survive.

Terminology note. Sometimes we will be talking about the evolution of sociums and sometimes about the evolution of civilizations, keeping in mind that a civilization is also a socium, only big. In extreme case – the biggest one we know (human civilization on Earth).

3. **Evolution is the measure of all things.** The laws of evolution are part of a single set laws of nature that are obligatory for us. Sociums that go against the laws of evolution are doomed to perish. The meaning of human life lies in the best adherence to the laws of evolution. The maxim of Protagoras (5th century B.C.) “Man is the measure of all things” is untenable; in fact, the maxim “evolution is the measure of all things” works.

Evolution is not “concerned” with the interests of man or anyone else. The evolution of Neanderthal man which had transformed him about 40 thousand years ago in Cro-Magnon (the modern person), wiped out

Neanderthal man himself in about 5,000 years. The further course of events brought not much happiness to people. Although following the laws of evolution does not bring people happiness, evolution is unstoppable.

4. The evolutionary principle of minimax. Evolution does everything possible under given specific conditions, as if there were a law, which forces evolving systems not only to increase their complexity and variety of forms, not only to intensify metabolisms with cycles, etc., but also to do this as frugally as possible. By maximally intensifying the metabolisms, living organisms simultaneously minimize their losses by constantly solving the minimax tasks [3, 4]. Maximizing their income and making up more and more new pleasures of life, people minimize their expenditures on them. And so on.

The founder of the evolutionary morphology of animals A.N. Severtsov [5] has produced the idea that progressive improvements differ from non-progressive ones in that they open the way for further improvements. Let's start with this idea. Expenditure of energy is progressive when it sets the stage for later expenditure of energy. Money must make money. So – everywhere and in everything.

We arrive at the evolutionary principle of minimax: in each macroscopic fragment of the observable world, the intensity of interactions leading to their further intensification is maximized and the intensity of interactions not leading to their further intensification is minimized.

Both systems intensifying the interactions insufficiently and those doing it too quickly, overusing resources, lose the evolutionary competition. The USSR collapsed precisely because its economy and all social life were too costly, being carried out with catastrophic overuse of resources – human, material and energy.

5. The “effect of shaking” evolutionary systems. Imagine a plastic tray with a magnet on it and iron filings scattered randomly. When the tray is gently shaken, filings form a structure on the tray that reproduces magnetic lines of force.

When applied to evolution, this “shaking” is the “shaking” of evolutionary systems. The role of the magnetic field, which creates a constant pressure on the filings, which does not lead to visible consequences in “peaceful” time, is played here by the interactions that create a constant pressure on the evolving systems. The role of the “shaker” is played by catastrophes occurring on the Earth from time to time, which, starting with the book by Georges Cuvier [6], appear in the concepts of evolutionary catastrophism. For example, recall the plague pandemic of the 14th century in Europe:

“The plague pandemic of 1345–1349 so ravaged and devastated Europe that one would have expected a delay in the historical process. This, however, did not happen. Just in the fourteenth century, the development of bourgeois relations began in Italy (Florence), in Flanders, and partly in England” [7].

By creating stress pressures on evolving systems, catastrophic events of external origin dramatically increase the effect of internal interactions pressures on them, stimulating evolutionary self-assemblies. Under stress conditions, the evolving system becomes desta-

bilized and labile, the scope of arising mutations (innovations) expands until the system recover from the crisis.

However, evolutionary catastrophes can also occur for internal reasons. It has already become a cliché that social crises as a rule lead to great changes. Here, in its pure form, we have a manifestation of the “effect of shaking”: the crisis causes stressful pressure on socium members, stimulating evolutionary mental and behavioral self-assemblies, among which, due to the presence of a stochastic component in evolution, there are not only self-assemblies that contribute to the elimination of the roots of the crisis, but also self-assemblies “directed in different directions”. This is why such crises stimulate not only the transition to another socio-economic formation, but also the emergence of new trends in art, science, etc.

Our evolutionary “effect of shaking” echoes not only Cuvier's evolutionary catastrophism, but also Arnold Toynbee's concept of Challenge-and-Response. Whereas evolutionary catastrophism emphasizes catastrophes of external origin, according to Toynbee, external challenge is combined with internal stimulus. Moreover, Toynbee insists that the continuous development of civilization can only occur when it itself generates a successive chain of challenges:

“In so far as this grows and continues to grow, it has to reckon less and less with challenges delivered by external forces and demanded responses on an outer battlefield, and more and more with challenges that are presented by itself to itself in an inner arena. Growth means that the growing personality or civilization tends to become *its own* environment and *its own* challenger and *its own field of action*” [8].

“Catastrophe noise” as a necessary condition for the survival of civilization

So far, in describing the author's version of the autogenetic concept, we have followed the book [1]. Now we will go further and introduce the new concept – “catastrophe noise” (it is constructed by analogy with the term “white noise”).

What was said in the fifth point of the previous section means that catastrophes (and stressful situations in general) are a necessary component of the life of sociums, providing, in accordance with the evolutionary principle of the minimax, their evolution some optimal rate and, thus, their survival. In the absence of catastrophes, the evolutionary speed decreases, which leads the sociums to degradation and the consequent death. On the other hand, sociums are brought to death by catastrophes that are too destructive. We come to the conclusion that a certain optimal level of “catastrophe noise” in the life of a socium, determined by the evolutionary principle of minimax, should be present. If the actual level of “catastrophe noise” is higher or lower than the optimal level, the socium's evolution slows down; if it is significantly higher or lower, the socium perishes.

Let's talk about it once again. If all catastrophes are prevented, civilization will die because of an excessive reduction of the “catastrophe noise”, i.e. due to the disappearance of this driving force of evolution. If no action is taken to prevent catastrophes, civilization will

also perish, but from exceeding that level, i.e. from the destructive effects of catastrophes. The picture is enormously complicated the fact that the optimum level of “catastrophe noise” is in principle incalculable.

My contention (Arnold Toynbee did not say this, although it is in the spirit of his concept) is that civilization, in order to ensure its guaranteed survival, has created three specific mechanisms for generating catastrophes to speed up its evolution: war, market, and science. In other words, civilization creates “catastrophe noise”, as they say, with its own hands.

War as the generator of “catastrophe noise”

In the history of humanity, evolutionary breakthroughs were repeatedly brought about by devastating invasions of barbarians on this or that civilization. In some cases, their strike brought civilizations to ruin. In others, however, this collapse was not final; there was an “afterlife”: a new civilization arose on the ruins of the old one after the end of the recession, which could last for several “dark ages”; as a rule, this represented an evolutionary step forward.

So, classical Hellenic civilization emerged after and as a result of the destruction of the Cretan-Mycenaean civilization by the Achaeans (mid-15th century B.C.) and Dorians (around 1000 B.C.). The period between the twelfth and eighth centuries B.C. is the “dark ages” in the history of ancient Greece, after which it began to flourish. Its rise in the fifth century B.C. was, largely, due to the repulsion of Persian aggression.

Western civilization arose due to the invasion of the Western Roman Empire by the Huns, the Visigoths, and the Germans in V century A.D. Between the collapse of Western Roman Empire and the occurrence of Western civilization, three “dark ages” passed, through which Europe was transferred by Christianity. Already in the second half of the eighth century, Charlemagne created his empire, and from the end of the eleventh century, Western civilization, due to the excess of its power, shifted to expansion (crusades, conquest of the New World, etc.).

In many ways, it was war and military armaments that stimulated social evolution. For example, war directly participated in the emergence of cities through an almost continuous armed struggle between sociums. Medieval civilization in its European version could not have taken place without knightly arms, and would not have given way to an absolutist state without the creation of firearms. And so on and so forth.

The market as the generator of “catastrophe noise”

Wars stimulate social evolution very ineffectively, with enormous collateral damage. That is why, the social world has long ago created a much better mechanism to stimulate its evolution. It is the market, which, unlike war, provides a constant stress-pressure for members of socium, creating for them a “permanent disaster” effect and thus stimulating an evolutionary mental and behavioral self-assemblies.

Thus, being tuned to generating innovations, the market economy is constantly “shaken up”, continuously renewing itself and staying in the mode of “creative destruction” [9].

While working permanently and in a directed way,

market is more effective than war as a mechanism stimulating the evolution of socium. Moreover, the instability introduced by war prevents the market from functioning properly, reducing its efficiency. Therefore, throughout human history, sociums have tried, with varying success, to eschew war in favour of market. People are gradually learning to do without war, creating stressful pressure, necessary for evolution, on an individual through peaceful market means.

The twentieth century saw a turning point in the market's struggle against war, prompted by the transition in developed countries to Keynesian economics (the name derives from one of its fathers, John Keynes). In a nutshell, the Keynesian idea can be summarized as follows: high consumer demand and high wages do not only benefit employees, but also employers. Today, the Keynesian economy has been realised in the “Golden Billion” countries, where employees' wages are 40–70% of the value of production, which, by raising consumer demand, has brought the economy to fairly steady growth.

For the first time in human history, the Keynesian market made power conflicts between countries superfluous. It is not profitable for a country with Keynesian economy to exploit poor countries with low consumer demand, it is much more profitable to cooperate with rich partner countries with high consumer demand. It is therefore not in the interests of Keynesian countries to exploit poor countries, but rather to help them also become developed by making the transition to the Keynesian economy. The colonial system did collapse in parallel with the development of the Keynesian economy after World War II, because it became unprofitable. As a result, the market, as a more effective means of stimulating social evolution, began to win over the war. It is the fact that countries with Keynesian economies (post-industrialized countries) do not fight with each other.

Science as the generator of “catastrophe noise”

Neither war nor market aim directly at stimulating social evolution by generating innovations. This turns out to be a by-product of their actions, resulting in “catastrophe noise” (catastrophic and other stressful situations) that stimulates evolutionary self-assemblies. In the case of science, the situation is reversed: the generation of innovation is its immediate task, whereas “catastrophe noise” turns out to be a by-product of its activities.

Not just certain research fields such as nuclear physics, genetic engineering, and artificial intelligence, which are on everyone's lips, come out to be (or may come out to be) catastrophically dangerous. Scientific researches in many and very different areas, including some of the most seemingly innocuous, can turn out to be dangerous. What could be more innocuous than a socio-economic theory developed by an armchair scientist? Initially nobody could imagine that Karl Marx's theory would cause a global social upheaval (social catastrophe) with tens, if not hundreds of millions of victims.

But it is not only about the danger of these or other either scientific directions. All scientists, scientists as

such, are potentially dangerous, including the most brilliant and right-minded. Let us briefly discuss further the professional defects of scientists that make them generators of “catastrophe noise”.

1. Tendency to make untenable generalizations.

We are talking here about the principle of fallibilism, according to which any scientific theory, including the most fundamental and generally accepted, tomorrow may (or may not) be wrong. Thanks primarily to Karl Popper, who in the second half of the 20th century fundamentally substantiated this principle, it has been adopted by virtually the entire community of philosophers of science (but by no means by all scientists).

Today, there is nothing mysterious about the principle of fallibilism. Scientists' statements can be single (singular) and universal. The former are statements about single facts such as “the heat machine *A* has a cold reservoir”, “the heat machine *B* has a cold reservoir”, etc. The statement “all heat machines have cold reservoir” is universal. Scientific theories, that interpret empirical facts, are obtained by scientists by generalizing a finite number of single facts and giving their conclusions a universal meaning.

The problem is that any generalization is a roulette; by generalizing, a scientist can always get into trouble. A single violation of a universal statement is enough to disprove it. For example, we cannot 100% reliably prove the validity of the energy conservation law, because we are unable to enumerate by hand all possible cases of transformation of one form of energy into another. If even a single case of violation of this law is found, it will force us to stop regarding it as a universal law of nature.

Importantly, scientists are not only compelled by the nature of scientific knowledge to make non hundred percent justified generalizations, but are prone to them: they rush ahead of other scientists to be the first to declare their discovery (the struggle for priority is the driving force of scientific creativity).

2. Coding of readers and listeners by scientists.

The term “coding” is used here in approximately the same sense in which physicians talk about, for example, coding alcoholics with psychotherapeutic means.

In seeking to influence directly the subconscious of readers and listeners, the authors of scientific innovations often go beyond purely scientific arguments by applying the same persuasion technique as advertising, where the promoted product is shown to the public in conjunction with something that evokes obviously positive emotions. For example, they put funny kids and animals in advertising. As a result of repeated “reception” of ads we subconsciously develop a positive perception of the advertised product.

Following this recipe, the authors of scientific discoveries use key terms for their innovations, along with those that have a deliberately positive or negative connotation. “Average” scientists are also subject to the sin of coding: such are the general laws of thinking, not just scientific thinking. We all strive to express our thoughts as convincingly as possible, unconsciously using coding techniques. When coding each other, we most of all succumb to the coding by our great predecessors: brilliant scientists sometimes achieve astonishing results in

this genre.

Let us cite as an example the theory of natural selection that was discussed at the beginning of this paper. The specific mechanism proposed by Charles Darwin for the emergence of evolutionary innovations, i.e. the mechanism of natural selection, let's say mildly, is not indisputable. Nevertheless, Darwin's theory long supplanted competing evolutionary concepts. And, I believe, that was largely due to the “apt” name Darwin chose for his theory.

Indeed, the term “natural” carries no information about the specifics of Darwin's proposed mechanism of organic evolution. But it does suggest to the reader that it refers to something ordinary, normal, real, standard, usual, routine, reasonable, understandable (I have extracted from the dictionary some meanings of the word “natural”). Being absolutely incorrect for its scientific meaning, this choice turned out to be extremely effective in terms of coding: for a long time, as nothing else, it provided, at the subconscious level, a positive attitude of the scientific and near-scientific community to the theory of natural selection.

The second example is the antipode of the first. J.-B. Lamarck [10] thought the evolution of the organic world to be occurring as a result of the nature's self-development. According to Lamarck, the means by which nature creates more and more complex organic forms are interactions, among the various forms of which Lamarck gave priority to heat and electricity. No mysticism. Unfortunately, in accordance with the scientific language of the 18th century that nurtured him, Lamarck called the interactions that drive organic evolution *invisible fluids*, which were already considered as something mystical by scientists of the 19th century, and this shifted Lamarck's fully rational autogenetic conception of evolution from the proscenium of evolutionism for by almost two centuries.

3. Scientists adhere to outdated generalizations with all their might. The public conscience is set up to be too tolerant towards scientists. It is generally accepted that they are doing everything they can to get rid of their mistakes. Karl Popper's rendition of this myth is as follows:

“I do not know any creative scientist who wouldn't make mistakes – I mean the greatest of them: Galileo, Kepler, Newton, Einstein, Darwin, Mendel, Pasteur, Koch, Crick and even Hilbert and Gödel... Of course, we all understand that we should not be mistaken, and we are doing our best... At the same time, we are nevertheless sinful animals – sinful mortals, as the early Greek philosophers would say: only gods can know; we mortals can only express opinions and speculations” [11].

The pastoral, painted by Popper, has little to do with reality. Scientists try to get rid only of intra-paradigmatic errors: flaws in logic, errors in calculations, incorrect experiments. And most scientists do not hurry to get rid of paradigmatic errors that arise from unfortunate generalization of a group of single facts. On the contrary, they defend canonical theories to the last bullet, despite those theories fail under the pressure of new empirical facts.

There are three main factors to blame for the occurrence of this professional defect of scientists. **Firstly**, the coding of potential opponents by the authors of scientific innovations, discussed above.

Secondly, the phenomenon of imprinting, discovered by Konrad Lorenz in the animal world and also acting in the world of people, including science. If newly hatched ducklings or chicks are presented with a moving balloon or a cardboard box, then they will follow it everywhere as their mother, not being able to “critically reconsider” their attitude towards it. Something similar happens to young scientists: we all tend to regard the scientific ideas we are taught as immutable truths, the revision of which becomes extremely difficult for us.

Thirdly, the scientific community's continued rejection of the principle of fallibilism, discussed in point 1 of this section. Most scientists still adhere to the concept of the cumulative growth of scientific knowledge, according to which new truths are added at each current moment in time to the old ones, while all previously obtained truths are retained. Cumulativism has collapsed under the influence of facts which say that the development of science is different: in science it is the norm to discover the fallacy of old theories and to develop new ones in their place.

It is clear that if you believe that scientific knowledge is a set of 100% reliably established truths and that its development is a process of accumulation of such truths, a triumphant march from one truth to another, then for you the ideas of our great predecessors are unquestionable truths. This is the position of the modern community of scientists, with rare exceptions.

The combination of these three factors works flawlessly. It becomes clear why the modern scientific community sees the great scientists of the past as prophets of absolute truth.

Of course, there is nothing wrong with honouring the great scientists of the past in itself. It is not good if and when this reverence is excessive. And so it becomes when we identify weaknesses in a given scientific theory, which we inherited, and we defend it at all costs with sincere faith in its truth, distorting facts and logic. A talented (and all the more so, a brilliant) scientist has no problem finding new theoretical justification for an inherited universal statement (generalization) that he or she considers valid, and the old theoretical justification of which ended in a fiasco.

4. The scientific community is dominated by an atmosphere of rejection of scientific dissent. This is happening for the same reason: because most scientists continue to believe in the immutability of the scientific truths they produce. Any scientific dissidence, any deviation from the mainstream, any deviation from a particular school of thought or even from the point of view of a particular scientist, is perceived by that particular scientist, by that particular school of thought or the mainstream scientific community (the scientific establishment) negatively. The harshest resistance is caused by the most innovative works.

5. The penchant of scientists for sociopathy. Driven by the desire to make scientific discoveries and perpetuate themselves in the annals of science, some

(many?) scientists – otherwise perfectly normal people – become sociopaths devoid of empathy, capable of pushing through their discoveries at any cost, disregarding their danger to people.

As proof, I will briefly retell David Reimer's heartbreaking story, which took place in Canada and the USA and is described in Francis Fukuyama's book [12], which in turn follows John Colapinto's book “As Nature Made Him: The Boy Who Was Raised as a Girl”. Reimer was born a boy in 1965. As an infant, he had problems urinating due to phimosis. He was circumcised at the age of 8 months for this reason, but it was not done very well.

This is where the famous psychologist and sexologist John Money comes in. To test his hypothesis (Money believed that a person's gender identity is not determined by nature, but is instilled by the environment) he persuaded the boy's parents to change his sex, including complete castration. Reimer had not only the remnants of his penis, but also sex glands removed, and he had the rudimentary female external genitals formed. He was then supposed to be raised as a girl and an operation to create a vagina was planned for his adolescence. It ended tragically: as a teenager, Reimer resolutely refused the planned operation, then attempted to create a two-parent family with his wife and adopted children, but at the age of 38 he committed suicide, which his parents blamed on Money's methodology.

To be clear. Money has shown himself to be a sociopath, but not a psychopath. The difference is that a psychopath's lack of empathy is the result of genetic predisposition, whereas a sociopath's one is influenced by his environment. Money's sociopathic stamp was imposed on him by his profession. As Fukuyama writes, “John Money was driven by a combination of scientific vanity, ambition, and the desire to make an ideological point, characteristics that led him to overlook contrary evidence and work directly against the interests of the patients” [13].

It is this obsession of scientists with developing and promoting their own scientific innovations that makes otherwise wholesome and mentally healthy scientists potentially dangerous to the people. Many of scientists do so under the assumption that they are working “for the good of mankind”. This attitude, I believe, is extremely dangerous, allowing a scientist, when “necessary”, to justify any violations of generally accepted moral standards.

When a scientist decides that he has made, or is about to make, a major discovery, he “goes mad” as far as his potential discovery is concerned, turning into a “sociopath of directional action” with no empathy for people. The main thing for him in this state is to make a world discovery “for the good of mankind”, and thus to become famous. And everything else can go to hell. He is ready to risk both his own fate and the fate of others, both of individuals and of the entire humanity for its, humanity's, benefit.

Characteristically, John Money did not suffer any punishment under the law. Nor was he ostracized by his colleagues. There was only criticism of his hypothesis by those who did not share it. In this case this reaction

of the scientific community, in my opinion, characterizes it (the scientific community) in a quite sociopathic way.

Let us emphasize once again that, for the vast majority of scientists, the penchant for sociopathy is manifested only when it comes to developing and promoting their discoveries, and in everyday life, scientists are perfectly normal people, not sociopaths. Thus, a scientist is prone to sociopathy precisely as a scientist, i.e. as a person working in science. Thus, he is a dangerous for civilization in exactly that capacity.

As far as I know, the predisposition of scientists to become sociopathic has not yet been discussed in the scientific literature. Instead, the ethical neutrality of science has been discussed. These two phenomena are related, because an ethically neutral person is simply a beautiful label for a person deprived of compassion, or empathy, for people, i.e. a sociopath. You can talk about a person's lack of empathy, or you can talk about their ethical neutrality, which is essentially the same thing.

To sum up our invectives against scientists, we must admit that the scientific community sorely lacks a critical attitude to itself and empathy for people. That is on the one hand. On the other hand, science has placed such powerful forces of nature at the service of humanity that the actions of even a single scientist or a single scientific laboratory (say virological one) can lead to a global catastrophe. This combination is extremely dangerous for civilization.

“Catastrophe noise” as an unremovable threat to the existence of civilization

Let's briefly recap the plot of the paper again. Catastrophes (and stressful situations in general) have an ambivalent effect on sociums, manifesting the fundamental contradiction of evolution. On the one hand, by destroying established structures, catastrophes contribute to the stagnation and demise of sociums. On the other hand, the same catastrophes stimulate evolutionary self-assemblies, which helps sociums evolve and thus survive. That is why, there is always “catastrophe noise” in the life of sociums. If, however, it is above or below some optimal level, the socium degrades; if it is significantly above or below, the socium perishes.

To ensure its survival as long as possible, a civilization generates “catastrophe noise” for itself by creating special mechanisms: war, market, and science. War was the first to enter the game, and for a long time it dominated. Wars made geopolitical sense, when it made sense to seize territories. And it made sense when agriculture dominated the economy, and the more territories a country had, the more successful it was. In the second half of the twentieth century, with the establishment of the Keynesian economy in the “Golden Billion” countries, the situation changed. While in the nineteenth century, the agriculture of the now developed countries employed the bulk of the economically active population, today it employs only 2%–6%. With the decline in the importance of agriculture for economy, the conquest of territory and wars with it, lost their meaning. Accordingly, the market has come forward as the generator of “catastrophe noise” in the life of sociums, and today there is already science, which

seems to have a great future in this respect.

With regard to the “catastrophe noise” generated by war, market, and science, the fundamental contradiction of evolution remains valid. If the catastrophes they generate are excessively devastating, it leads civilization to ruin. If, on the contrary, the catastrophes they generate do not reach the optimal level of “catastrophe noise”, the speed of social evolution declines, which again leads to the degradation and destruction of civilization.

It is extremely significant that the optimal level of “catastrophic noise” in principle cannot be calculated. There is no way to quantify the total impact of the catastrophes on socium: whether and to what degree they contribute to societal development or, on the contrary, to societal degradation. These quantifications are impossible neither in the gross: for all the catastrophes in the life of a given socium over a certain period of time, nor in details: for each individual catastrophe taken individually. Economists have already learned to measure the material damage from catastrophes in money, but the relationship of this material damage to the evolutionary future of socium remains unknown, because it is absolutely unclear how to estimate the evolutionary outcome of catastrophe-induced evolutionary self-assemblies.

Although it is impossible to calculate the level of “catastrophe noise” in principle, civilization, as it has no other way out, tries to manage it by finding its optimal level by experience. Naturally, this does not work out very well in all three cases: war, market, and science.

1. **War.** Being unaware of the evolutionary significance of war and the evolutionary ambivalence of its nature, people, nevertheless, have long tried to bring wars into some kind of framework, to regulate and limit them, to grope an unknown optimum level for the “catastrophic noise” that they generate. There were introduced “rules of war”, rules for treating prisoners of war and civilian population, bans on the use of chemical and nuclear weapons; also, international laws of war were introduced and developed. But all measures taken by civilization to put war on the right track are unremovably palliative and they do not give one hundred percent guarantee. Even today, war can spiral out of control and cause a global nuclear catastrophe, with the destruction of civilization as the final outcome. This is confirmed by the events caused by the special operation of the Russian Armed Forces in Ukraine that began on 24 February 2022 (as it is called by the Russian authorities; in the world it is called, to put it mildly, otherwise).

2. **Market.** What was the original task of civilization when it created the market? It was to ensure that the market creates stressful pressures on its participants, but that these pressures are neither too weak nor too strong. Too much pressure is put on market participants by criminals and the state. That is why sociums impose laws to protect the market from them. Independent branches of government, free elections, etc., – in short, all these democratic institutions limit government interference in the market. In turn, law enforcement structures, administrative and criminal laws limit the intervention of criminals in the market. But, as in

the case of war, all the measures that civilization has taken to bring market into some kind of framework are unremovably palliative, providing no ironclad guarantee. The market is now and again breaking out of the control of socium, and then economic, financial and political crises occur, which sometimes take on a global character and which may one day end badly for civilization.

3. **Science.** If civilization has tried to bring war and market into some framework, to grope an unknown optimum level for the “catastrophic noise” that they generate, then so far very little has been done to bring science into the framework. The real work is carried out, perhaps, only in one scientific field – in medical and biological research on humans in order to protect them from overzealous scientists. De facto science today is a virtually unregulated source of “catastrophe noise”. Considering the ever-increasing power of science, where the awkward actions of even one scientist can lead to a global catastrophe, this situation is extremely dangerous for civilization.

It seems to me that, in order to survive, civilization will have to develop legislation for science similar to that made for war and market, but taking into account the specific nature of science. It is necessary to provide administrative and criminal prosecution of scientists for violations of the legal regulations that will be devised in this area.

The direction of measures to control science is clear. This, of course, is tracking dangerous scientific research and restricting it. But not only: by compensating, as far as possible, for the professional defects of scientists, science could increase its effectiveness in accomplishing its primary task of producing evolutionary innovations, which will reduce the need for dangerous research. In the light of what I have said about science in the previous section, I believe the following measures are necessary:

- A change in the whole atmosphere of scientific life towards the development of an attitude favourable to scientific dissidence;
- Fighting the cult of great scientists as bearers of absolute scientific truth;
- Changing the whole philosophy of rewarding scientists: prizes should be awarded for new large-scale, intelligently presented ideas, without requiring them to be true, given that controversial and even erroneous ideas can be extremely fruitful;
- Condemning and possibly penalizing scientists for “coding” colleagues, i.e. using unscientific persuasion techniques based on advertising techniques;
- Restricting or even banning anonymous reviewing;
- The involvement of “juries” selected by lot from “ordinary” citizens, in the control of science so that they can prevent the sociopathic excesses of scientists.

Unfortunately, in general, the situation with the of protection civilization from science is similar to that with war and market: all measures to prevent dangerous scientific researches, including those mentioned here, are unremovably palliative. We know that scientific researches must be controlled to ensure some optimal

level of their catastrophicity. But we do not know what the optimal level of catastrophicity for all scientific researches is. This optimal level is in principle incalculable and can only be groped by experience.

Conclusion

The above can be extended to all catastrophe generating mechanisms created by civilization: not only to war, market, and science, but also to others, perhaps left out of the author's field of vision. The problem of incalculable optimal level of “catastrophe noise” has no constructive solution in principle. There is no cognitive tool, no practical considerations that allow us to understand that this particular catastrophe brings us closer to the optimal level of “catastrophe noise”, and another, on the contrary, distances us from it.

As far as I know, the only practical consideration of this kind, and by the way, it is widely applied today in the world – is the so-called *precautionary principle* adopted in 1992 at the UN Conference on Environment and Development. According to it, if there are threats of serious or irreversible damage to the environment, the lack of scientific basis for threat assessments should not be used as a reason to postpone the implementation of measures aimed at preventing it.

It seems obvious that widespread adherence to the precautionary principle will lead to an uncontrolled reduction of the level of “catastrophe noise” in the life of a civilization, which will cause an evolution inhibition dangerous for its existence.

We come to the conclusion, and this is the main conclusion of our paper, that civilization is doomed by the laws of evolution to dig its own grave. To survive, it generates in operation mode “catastrophe noise”, which level cannot be controlled adequately in principle. Civilization can only grope the optimal level of “catastrophe noise” by experience, getting bumps and bruises. Because of the unremovable imperfection of the controlling of the “catastrophe noise” it generates, civilization will sooner or later perish from it, if it would not perish earlier from catastrophes of external origin.

To console the reader, it can be said that this is, as described here, how the entire everyday life of human individuals does on in the sense that it all runs in a fog of uncertainty and unpredictability of the results of our actions and our future. We achieve everything by experience, by getting bumps and bruises. What lies ahead, and this is the only thing which is assured, is death from old age or as a result of our own mistake. Unless, of course, we perish in a catastrophe external to the individual. The life of human civilization in many ways, if not in the main one, is similar to that of a human individual.

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SOCIAL SCIENCIES

MILTON'S SONNETS VII AND XIX: AN EXPLICATION

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[DOI: 10.5281/zenodo.7002951](https://doi.org/10.5281/zenodo.7002951)

Abstract

In this study, I will examine what comes over John Milton's creative productivity using the early-written Sonnet VII and the late Sonnet XIX. Sonnet VII is about time and how it rushes by, whereas Sonnet XIX is about Milton's blindness. We can see the severity and depth of literary matter from the content of each sonnet; however at the end of each sonnet, Milton becomes more aware of his problem, his God, and even the remedy.

Although there are many nice lines in Milton's early poems, especially those written before 1632, they are not particularly noteworthy. As a result, when he writes Sonnet VII, he finds that he has accomplished very little of what he had anticipated. In this short article, I'll analyze and contrast these two sonnets: VII and XIX, and discuss how they reflect key characteristics and poetic contrasts in Milton's early and late poetry.

Keywords: Milton, sonnet, VII, time, XIX, blindness

Introduction

John Milton (1608-1674) is a famous literary figure. He is known for his masterpieces *Paradise Lost* and *Paradise Regained*. In addition, he has written twenty three sonnets; two of them are Sonnet VII and Sonnet XIX. Griffith (1991) claims that these two sonnets are among the best written sonnets (p. 39). Lawry (1968) has referred to "the Sonnet 19 and the early Sonnet 7" as good examples to compare between "the early and the late poems" written by Milton (pp. 16-17). In this short article, a comparison between these two sonnets will be applied. The goal is to understand Milton and the change that has taken place in his poetry. This study of Milton's two sonnets uses the method of close reading where the focus will be on details in order to understand the meaning of the text in question. Burke (2020) defines close reading as "thoughtful, critical analysis of a text that focuses on significant details or patterns in order to develop a deep, precise understanding of the text's form, craft, meanings, etc." (p. 2). Hence, these two sonnets will be explained and analyzed line by line to achieve this goal.

Discussion

"How Soon Hath Time," a Sonnet by John Milton, portrays vivacity, freshness, light, and other qualities associated with a young man. On the other hand, Sonnet XIX, "When I Consider...", addresses major issues such as blindness, doubt, sorrow, and struggle. These are topics for a wise and experienced man. Anyhow, in order to understand these two sonnets in light of what has been mentioned above, it is preferable to examine and explain each sonnet separately, then compare and contrast the differences, changes, and similarities that occur in these two sonnets.

A. Sonnet VII:

On December 9, 1631, Sonnet VII was most likely written. John Milton's twenty-third birthday is on this day. His "three and twentieth year!" is mentioned in the sonnet. Pattison, 1889, argues that it is written on Mil-

ton's birthday. It's written for a buddy who has chastised Milton for his insatiable desire to study. He has traditionally preferred reading and learning. As Macaulay (1935) points out, it's possible that his studies were the cause of his blindness later on (p. 115). Anyhow, this sonnet is considered an autobiographical poem as the poet utilizes the first person: "my", "I", and "me". However, "it is also clearly intended to instruct its readers and to help them manage their anxieties" (Roy, 2021).

Although the last three lines rhyme d c e instead of c d e, hence it's a Petrarchan sonnet. This rhyme reveals Milton's concern for time, despite the fact that he appears patient and knowledgeable of fate and God's purpose of his creation. The lines of this sonnet are written in iambic pentameter. In this sonnet one-syllable words prevail. This gives the sonnet a more musical tone in general. Most nouns, such as time, youth, year, manhood, and so on, have their own connotations. Along the sonnet, there are terms like "three and twenty year," "late," "so near," "less," "ripeness," and so on that keep time in mind.

The personification of "time" at the start of Sonnet VII, by the way, retains its depiction in mind throughout the poem. Milton sees "time" as a thief of youth with wings. He has stolen Milton's "three and twentieth year" on his wings. Here, "he personifies time with a bird, which takes his age away on its wings" (beamingnotes.com contributor). "But my late spring neither bud or blossom show'th," Milton says of that year's "spring." The term "spring" can refer to a season (which is significant to the year) or a fountain of pleasant water. Plants will benefit from the presence of a fountain. Here's a question: when Milton says "fountain," what exactly does he mean, and how does that fit into the context? He could be referring to something (poetry) that irrigates people's thoughts. As Honigmann (1966) argues that Milton uses "bud or blossom" to refer to poetry (p. 98). Otherwise, he's referring to the time when a little of work has been accomplished.

Indeed, Milton expresses regret that he lacks a profession or "career" in line three. When he says "bud or blossom," he means that he thinks his career should be poetry and how to water other people's thoughts. His output is low, despite the fact that he is getting older. One's age can sometimes be deduced from his appearance. The term "may" in line five alludes to the rarity of such a scenario, however it proves to be true for Milton, who matures early. As a result, he claims, "my resemblance might deceive the truth."

Moreover, Milton demonstrates how he has grown into his manhood. Manhood is affirmed by the ripeness of the mind. Despite this, he complains that his "inward ripeness" has resulted in fewer works than those of others his age who have completed more. Those "more timely-happy spirits," according to Honigmann (1966), are among his contemporaries, such as Randolph (b. 1605), Abraham Cowley (b. 1618), and others who published works by that age (p. 96). Thus, in the octave, Milton appears to be lamenting the passage of time, which has robbed him of his age, despite the fact that others cannot notice. He also bemoans the fact that he has produced fewer works than others at his age.

However, Milton becomes patient throughout the sestet, employing one-syllable expressions to express his faith in fate, whether it be chance or God's plan. Line 12 implies that time, in its natural course, will bring about the outcome that is predetermined. Under the Creator's guidance, both chance and God's will may be employed, and Milton aspires to be able to use both to serve his God. It is his destiny; he will "wait and see the grace of the 'Task-Master,' or God, anticipate for his blessings that may his fortunes change into better someday" (beamingnotes.com contributor). The term "Task-Maker" at the end of the sonnet indicates that Milton believes that everything is pre-arranged and pre-planned by God.

In general, Milton begins talking about time and how it passes in Sonnet VII. Then, he becomes conscious of fate in the sestet, and he is patient and wishes to serve God. This occurs in the octave as a result of his "manhood" and "inward ripeness."

B. Sonnet XIX:

Milton's Sonnet XIX, on the other hand, is about his hindrance, which is blindness. In 1652, he became completely blind, which could be the year this sonnet was written. He'd learned a lot by this point. His blindness is most likely due to his learning and education. While Sonnet VII was written to defend his learning and studies, Sonnet XIX is written to lament his blindness; he is asking God for help and makes it obvious that losing his sight has made it difficult for him to do anything.

In fact, Sonnet XIX is a Petrarchan sonnet in terms of structure and form. Its rhyme scheme ABBA ABBA CDE CDE is completely Petrarchan, implying Milton's understanding and knowledge of his circumstances. The lines are written in iambic pentameter. Because most words consist of one syllable, it has a big impact on the reader. Milton's skill to use words to convey his message may be seen in this style of writing.

In this sonnet, Milton also employs "monetary exchange" terminology, as Lawrence (1992) points out:

"spent," "exact," "account," "one," and "thousands" (pp. 271-73). He also utilizes words that imply time, such as "when," "days," "spent," "soon," "present," and so on. These connotative words convey a variety of meanings and concepts to readers. In addition, words like "death," "light," "ocean," and others are employed.

Anyhow, Milton laments his eyesight at the start of Sonnet XIX, claiming that he does not anticipate losing his sight until "half" his "days." His "sight is spent" at the age of forty-three or a year older. The word "spent" connotes both giving and taking; he is implying that the one who has given him the eyesight, i.e. God, is now taking back that sight. Everything is dark after he loses his sight. Milton refers to his world as "this dark world" in the second line of the sonnet. The word "consider" at the start, on the other hand, suggests that he is pondering. According to Raupp (2020), "when Milton loses his physical sight, he gains spiritual light, which he expresses in the sonnet" (p. 26). As a result, the reader will not be surprised by Milton's conclusion.

The servant who has not obeyed his lord in benefiting from his "talent" in Matthew XXV is afterwards remembered by Milton. According to Nicolson (1963), the metaphor for the sonnet is "the unprofitable servant" was thrown out into darkness for burying the money his master had given him in the dirt (p. 153). The term "talent" is a pun in Sonnet XIX. It does not refer to money; rather, it refers to the "inward ripeness" stated in Sonnet VII. Indeed, both the servant's money and the "inward ripeness" are gifts from God, according to Milton. Milton's gift is his "inward ripeness," which he describes as "death to hide." It is hazardous to keep knowledge hidden from others; knowledge should be shared. He is defending his case and complaining to God at the same time. He believes he is ineffective because he lacks authority (sight). His soul, on the other hand, argues that he must serve his Creator. His soul compels him to serve his "Maker and present [his] true account," as he puts it. According to Sasek (1981), "his blindness [has] caused him to develop a new image of himself" (p. 17).

Furthermore, Milton asks the following question to clarify his point and stress his dilemma: "Doth God exact day-labor, light denied?" This question adds to the poem by stating his thesis and counter-argument: "Doth God exact day-labor," is the case, and "light denied" is the counter-argument. "I fondly ask," Milton quickly apologizes after explaining the case and defense. The reader might expect line 8 to continue the question, but the conjunction "but" follows that and shifts the focus. This enjambment, especially the one that connects lines 8 and 9, creates some kind of discord: "...But patience to prevent / That murmur..." An idea is expected to be in the sestet, however the phrase "but" mingles both octave and sestet. In the octave, Milton laments the injustice of his predicament, and patience appears to respond to his query. According to Brilsby (2018), "Patience is not a virtue of truth; it is a virtue of endurance. Patience only aims 'to prevent / That murmur', not to prove the murmur is groundless."

Patience is personified in the following lines. She arrives to stop the nonsense and states, "God doth not used / Either man's work or his own gifts" (Lines 9-10).

God does not employ man's work or his own skills. "His State / Is Kingly": the sestet affirms that Milton needs God's help, but God doesn't need anyone: "His State / Is Kingly." Everything is carried out at His command. Thousands of angels serve Him under His command, "And post o'er Land and Ocean without rest" (Line 13). Finally, Milton makes his confession of faith: he wishes to serve God, if only by accepting his orders and waiting for them to be fulfilled. Angels and those who "stand and wait" are both serving God in this way.

C. Comparison

Returning to the first point made at the outset of this article, Milton's two sonnets, VII and XIX, share certain parallels and have distinctions as well. Milton is a man of vast knowledge, as evidenced by his writing. In these two sonnets, his ideas are expressed explicitly through melodic music that provides harmony and concord to the sonnets.

Each sonnet examines and explores a problem. Sonnet VII deals with time whereas blindness has been addressed in Sonnet XIX. In the first sonnet, Milton recognizes that time will carry out what has been predetermined, so he waits until "Time leads [him]..." at the end of this poem. In Sonnet XIX, his patience pays off and answers his inquiry. Finally, he realizes that God does not require anyone's help. As a result, he chooses to serve God. Due to the point that Milton's focus is on serving God in some way, that idea raises the question, "What does it mean to serve God?" (Piper, 2020).

Milton, on the other hand, is concerned about his output, writing "no bud or blossom" in Sonnet VII and "Lodg'd with me useless" in Sonnet XIX. Well, "when he could see, he wasted his sight. Now that he is blind, he fears—he knows—his remaining powers are 'Lodg'd in [him] useless'" (Brilsby, 2018). However, Sonnet XIX casts a dark shade; Milton bemoans his blindness and laments to God. Asad (2015) argues that Milton has had "faith in God for assisting him in his quest for greatness" in 'How Soon Hath Time' while "he lovingly accepts god's will in his divine scheme of things" in 'On His Blindness.' As a result, this sonnet depicts a powerful battle of pain and struggle. Sonnet VII, on the other hand, implies a youthful poem with a bright shadow (Lawry, 1968, p. 16).

Both sonnets rely on the reader's willingness to respond (Lawry, 1968, p. 17). Milton wishes to produce in Sonnet VII, but time has robbed him of his age. Here, "he personifies time with a bird, which takes his age away on its wings. Finally, he realizes that time is full of fate and destiny. In Sonnet XIX, there is a debate regarding whether or not to serve in the middle of the sonnet. God, on the other hand, does not need anybody and/or his/her service. As a result, Milton realizes that he must accept His directives and wait for them to be fulfilled.

Conclusion

Finally, both sonnets VII and XIX exhibit some of Milton's evolving poetic styles. Youth, brightness, activity, to some extent simplicity, and optimism are all presented in Sonnet VII. Strong struggle, originality,

sincerity, and to some extent pessimism characterize Sonnet XIX. And this shift is to be expected depending on the subject matter I examined in these two sonnets. Yet, there is a sense of religious bent; Milton has faith in his Task-Maker to guide him at the end of Sonnet VII whereas he ends up with embracing his limits and accepting God's will in Sonnet XIX.

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Anschrift: Industriestraße 8,74589 Satteldorf
Deutschland.

E-mail: info@dizzw.com

WWW: www.dizzw.com

Chefredakeur: Reinhardt Roth

Druck: Einzelfirma Artmedia24, Industriestraße
8,74589 Satteldorf Deutschland

Artmedia24

Address: Industriestrasse 8,74589 Satteldorf
Germany.

E-mail: info@dizzw.com

WWW: www.dizzw.com

Editor in chief: Reinhardt Roth

Printing: Artmedia24, Industriestrasse 8,74589 Satteldorf Germany.

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quired.

Materials are publishing in author's edition.

ISSN (Print) 2701-8369

ISSN (Online) 2701-8377

Edition: № 38/2022 (August) – 38th

Passed in press in August 2022

Printed in August, 2022

Printing: Artmedia 24, Industriestrasse 8,
74589 Satteldorf, Germany.

artmedia²⁴

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of Modern Science

