

# Information Model of Intelligence and Memorizing in Early Childhood

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**Abstract:** - The object of analysis of this paper is global model of intelligence and memorizing of information from conception until a child starts to walk for the period from 2009 until 2020. In order to define main characteristics and determinants, the model of growth was used. Numerous adequate scientific methods were used, the most important among them: analysis and synthesis method, inductive and deductive method, descriptive method, comparative method, statistical and mathematical method, modelling method (matrix of growth), proving and disproving method. As model variables are chosen key factors for strengthening of intelligence, and therefore of memorising of information. Quantitative analysis is than used in order to determine importance of individual variables as well as their interdependence.

**Key-Words:** - intelligence, learning, information memorizing, information model

## 1 Introduction

Until present the information model of intelligence and memorizing from conception until a child starts to walk, for the period from 2009 until 2020, was not made. Before making a model there was a need to define the object of scientific research: how to enable a person, by using its intelligence and memorizing capabilities, to ensure essential material conditions and personal happiness in the globalized world.

According to the defined object of scientific research the main scientific hypothesis was made: Prepare children's brain, by using scientific methods, to improve their intelligence and information memorizing until they start to walk, in order to achieve diplomas, academic master-of-science or doctor's titles. This would enable their personal progress as well as the progress of all human beings of the Planet Earth.

The scientific hypothesis defined in such a way implied several auxiliary hypotheses:

1. A mother's health before and during pregnancy as well as during lactation period is very important for learning capability of children during their life.
2. Food influences us in a way that we are what our mothers ate as well as what we are eating now.
3. The strengthening of senses (sight, hearing, touch, taste, and scent) creates prerequisites for tracing paths into the brain.

4. Speech is a unique human ability and children have to learn it by hearing, imitating and exercising.
5. The growing standard of population is a source of endangering the global environment and threatening the survival of the population of the Planet Earth.
6. Physical activity of children is important, among other reasons, because we are determined by what we are doing.
7. Addiction in the society such as addiction to narcotic drugs, alcohol, cigarettes etc. often results in our schools being full of socially problematic children with problems of attention and learning.
8. Informatization is an important reason for the need of increasing human intelligence and information memorizing, especially because of its very fast development.
9. The globalization influences on moving the capital to states with cheap manpower which results in a bigger unemployment in developed western countries.

Any child, from the earliest age needs to acquire as much as possible experience it needs. Its body should be left free as much as possible as well as its small hands and feet. Children should crawl and climb as much as possible. They should be allowed to make mistakes and to learn on their mistakes. Until present numerous scientists have been investigating the defined object of scientific research mentioned, the scientific hypothesis and auxiliary hypotheses.

Small children learn best by their own experience through all their senses. Accordingly these senses should be encouraged. Children grow according to models, and therefore they need to learn how to upgrade these models of development. Simple physical everyday routines can help children to learn fast [1]

Everything what happens in the brain during nine months before the birth is very important for learning abilities in a child's life [9]. Healthy food contains many nutrients good for the brain [23]. Scientific research projects very often indicate a relationship between food and other activities which stimulate brain development during the first five years of life [13]. Every person acquires at least seven types of intelligence [9]. The people have become dependent on electrical equipment, although they don't know its effects on human body [17]. Nation which will use the possibilities of computers and internet completely, and connects them with new learning technologies, will lead the world in the field of education [2]. The problem of increase in unemployment rate in the Euro-Atlantic zone needs to be compensated by improving education of their population [19].

The human brain surface consists of billions of active neurons. They will never be replaced by new ones. In the womb, the neurons develop from conception, approximately 250 000 per minute. It is scientifically established that the human brain starts to grow in the womb and develops intensively till the age of six [9]. Boys and girls acquire 50 percent of their intelligence between conception and the age of four, which is confirmed by test results [16]. Tests proved that 15 minutes of caressing per day will help a preborn baby develop its ability of coordination and learning [13].

Inappropriate mother's nutrition, smoking, drug consuming or exposition to toxic substances (such as led), lead to low weight and poor health of newborns. Later in life, heart disease, high blood pressure and stroke appear as a result of poor mother's nutrition during pregnancy [7]. Smoking, alcohol and drugs are most strictly prohibited for every pregnant woman [3]. In addition to the first nine months before the child is born, the first 10 years are most important in every person's life. In the first four years of life, 50 percent of learning abilities develop. Small children are best educators for themselves, and their parents their best first

teachers [1]. In reality, there is no division between physical and mental development of a child. All best educational programs all over the world combine elements of both, one and the other [13].

Quantification of the information model of human intelligence and memorizing of information until a child starts to walk, for the period from 2009 till 2020, will result from quality research, by transforming quality parameters of the chosen model variables into numerical form.

## **2 How to positively affect the development of intelligence and information memorizing from conception**

Most important variables of "The information intelligence and information memorizing model for the period from 2009 until 2020" are set and will be quantified for the period of 2009, 2015 and 2020: mother's health before pregnancy, during pregnancy and during breast-feeding, nutrition, senses enforcement: sight, hearing, touch, taste and scent, speech, standard, physical activity, addictions, informatization and globalization.

### **2.1 Mother's health before pregnancy, during pregnancy and during breast-feeding**

Brain of a fetus, a newborn and a small child develops in specific phases in exactly set time. If the brain doesn't have all the necessary nutrients for its growth, there can be a significant damage that cannot be corrected. The human brain surface consists of billions of active neurons. They will never be replaced by new ones. In the uterus, the neurons develop from conception, approximately 250 000 cells per minute. It is scientifically established that the human brain starts to grow in the uterus and develops intensively till the age of six [9]. Inappropriate nutrition of a small child can cause learning disabilities during its entire life, and it is not possible to compensate those insufficiencies whatever you do later. Being on a diet during pregnancy is most strictly prohibited. The brain mostly develops in sequences [13].

The most important period for a child's brain development is before the birth. Nutrition after the birth is also very important for the growth of all cells. Breast-feeding milk helps against ear infections, irritations and other allergies and ensures calcium and [phosphor](#) necessary for the growth of bones. The only thing that the breast-feeding milk of a healthy mother lacks is vitamin D. Therefore,

experts recommend additional consumption of vitamin D. Also, there is food for children which can be used instead of breast-feeding milk [7].

The quantified value of the variable "Health of a mother before pregnancy, during pregnancy and during breastfeeding" quantified for 2009 is 51.

## 2.2.Nutrition

Research on nutrition effect on fetus' brain showed that mothers who didn't have appropriate nutrition before and during pregnancy gave birth to low birth weight children with small skull [circumference](#) and low intellectual potential. Even in the industrially most developed countries, at least 10 percent of children are born having low weight. Nutrition after birth is also very important for the growth of all cells. Breast-feeding milk of a healthy mother is the best source of all necessary nutrients for a child's intestine and it protects its respiratory system from infections. Breast-feeding milk helps against ear infections, irritations and other allergies and ensures calcium and phosphor necessary for the growth of bones. The only thing that the breast-feeding milk of a healthy mother lacks is vitamin D. Therefore, experts recommend additional consumption of vitamin D. Also, there is food for children which can be used instead of breast-feeding milk [7].

Inappropriate nutrition of a small child can cause learning disabilities during its entire life, and it is not possible to compensate those insufficiencies whatever you do later. The better fitness the body has, the better digestion capacity is and the blood successfully transmits the nutrients over the entire body and the brain. Healthy nutrition contains many nutrients good for the brain. What is good for the brain is also good for the body. Brain and its nervous system are especially fed by certain amino acids, vitamin B-complex, and essential fats. All these nutrients can be found in abundance in fish together with minerals potassium, magnesium, iron, and zinc. Healthy nutrition should be composed of a food containing these basic nutrients [23].

The quantified value of the variable "Mother's health before pregnancy, during pregnancy and during breast-feeding" for 2009 is 70.

## 2.3 Strengthening of the senses: sight, hearing, touch, taste and scent

Children learn by the help of all the senses. Every day is one new experience of learning. Children like to experiment, create, and discover how things work. Challenges are there for the

children to take and for adults to imitate. As a child grows, the parents feel that it is getting easier and easier to encourage them to learn by the help of all the senses and because they can immediately get feedback [16]. There are five senses which lead to the brain: sight, hearing, touch, taste and scent. Basic speech strings, as well as visual ones, are developed during the first few years of life. If a small child could clearly hear and distinguish all sounds during the first few years of life, and if it would learn to pronounce them and use them, it would be capable of pronouncing foreign languages much better, then when learning them later in life.

It is necessary to identify every problem during the first three years of life, such as hearing or sight damage, because if children do not get help in these early stages of life, they will probably have difficulties during their entire life. Healthy children from good balanced surroundings learn to use at least 2,000 basic words from their mother tongue. If those children cannot hear, it will be much more difficult for them to speak fluently. If they can neither hear nor speak, it will be very hard for them to learn. Since early childhood children have to go through hearing and sight tests and most attention should be paid to nutrition and education. During the first few months of life a child will probably taste only two things: milk and vomit. Those are not very interesting tastes to distinguish. Therefore, it is recommended that mothers bring diversity into their nutrition: a bit of orange or lemon. Hearing is crucial for speech. Mothers intuitively speak to their children loudly and clearly and that is good. Listening to background music is also recommended, both before and after birth [16].

The quantified value of the variable "Strengthening of the senses: sight, hearing, touch, taste and scent" for 2009 is 70.

## 2.4.Speech

Speech is a unique human ability and the children learn it by hearing, imitating and practice. Therefore, from the very beginning you should tell them what you are doing. Read to them regularly. Remember the significance of positive stimulation. Make everything a fun speech game by introducing a subject, then transforming it to a game of questions. Songs for children are great, only because they rhyme, and rhymes are easy to remember. Colour books and reading are important for every child from the beginning [8].

Colour books need to be at a child's hand and children should get used to having different things

showed frequently as soon as they are brought home. Front pages are colourful, and from the very beginning a child can be encouraged to focus on those pictures. During the first few months of life, children can be taught a lot about books. It is good to show pages of colour books even to very little children. Children need cordial people who will present the world to them, they need stories and laughter. They need books matched to their own experience, books where language and illustrations will activate certain emotions. If they can taste, scent and touch an apple, they will most certainly learn how to pronounce that word [8].

The quantified value of the variable "Speech" for 2009 is 70.

### 2.5. Standard

The constant growth of the population of the Planet Earth enables higher education of parents. That is how we assume how parents affect development of intelligence with their children and increase of information memorizing capacity. With growth in standard, hypothesis such as healthy food affecting physical condition and brain potential by maintaining the body and the spirit sound. Parents need to make the growth of standard useful in order to offer their children warmth and tenderness, because that is very important for the brain development [22].

Children need cordial people who will present the world to them, they need stories and laughter. They need books matched to their own experience, books where language and illustrations will activate certain emotions. If they can taste, scent and touch an apple, they will most certainly learn how to pronounce that word [8].

Small children need to be played with. It is important to transform game into an experience of learning and make sure that learning is fun. Children learn from concrete and active experience. During playing they enjoy pushing, dragging, pinching and battering nevertheless those are toys or something else [18].

The quantified value of the variable "Standard" for 2009 is 50.

### 2.6 Physical activity

Physical activity very effectively traces the paths into the brain. Swinging a child stimulates the nervous system very tightly connected with the cerebellum and a child's inner hearing mechanism which also plays an important role in balance and coordination development. Scientists say that is one

of the brain parts which start to function early in the womb already in the 16<sup>th</sup> week of pregnancy. Tests proved that 15 minutes of caressing per day will help to a preborn baby develop its ability of coordination and learning.

For example, it seems that most parents instinctively recognize that their children like to be held tightly by their hands and spined around. Research showed those activities result in significant development of the brain. The final result is the improvement in competence and self-confidence, increased attention, faster reactions and capability to face complex learning activities. By using similar techniques, the scientists realized that spinning is ideal for many children, especially those with serious learning difficulties. Most learning problems is connected with lack of balance and problems with reflexes. Therefore, those exercises need to be practiced from the first day [13].

Children need to be able to crawl as early as possible. In fact, children can crawl from the day they were born, but are often not able to due to overload of clothes. The more they crawl on their stomachs, the more will they crawl four-legged, and more they crawl four-legged, the more easily will they walk. If children are bound in clothes tightly so they can't crawl on their stomachs, but start crawling four-legged, that can have consequences five years later when edging their sight [13].

The quantified value of the variable "Physical activity" for 2009 is 71.

### 2.7 Addiction

Drugs are most dangerous for the fetus during the first trimester of pregnancy when the heart, brain, limbs and features are formed. Every cigarette a mother has equals two for the baby because smoking causes lack of oxygen in the fetus' brain, and oxygen is necessary for the creation of cells. If a pregnant woman smokes 15 to 20 cigarettes a day, she doubles the chance of miscarriage. After birth in the first few weeks, the mortality rate of newly born children whose mothers smoked is 30% higher than with mothers who do not smoke. Children absorb poisonous nicotine ingredients also during breastfeeding so those children are more likely to have respiratory system infections and pneumonia. By smoking one cigarette a pregnant woman causes the fetus not breathing for five minutes [3].

Consuming alcohol during pregnancy or during breastfeeding can also damage the brain in development. The consequences can be: diminished brain size, bad movement coordination, deformed

facial features and hyperactivity. It is very important for the future parents to realize that alcohol is a very important drug which can create addiction with children during pregnancy. Alcohol attacks the whole body and the child's cerebral system.

During pregnancy it is not recommended to drink too much coffee and tea because of high level of caffeine. If a woman consumes more than 300 mg of caffeine a day, the ability to conceive can be reduced. That is about 3 cups of coffee, 6 cups of tea or more than 7 non-alcoholic drinks with gas a day [3].

The quantified value of the variable "Addiction" for 2009 is 55.

## 2.8 Informatization

Children dominate among the main communication tools for the first time in the history of the world because those are very close to them. The best learning methods are similar to those used by small children [2].

In the information era, new technology will bring human civilization nearer to the world where there will be almost no need for physical work. Even if nothing else affected the changes in learning styles and memorizing, the informatization would do enough [2]. Information technology enabling e-learning facilitates transformation of information society into knowledge society [5] [6] [10].

The quantified value of the variable "Informatizaion" for 2009 is 62.

## 2.9 Globalization

Globalization is the reason why in the EU till 2010 only 10 % of unqualified workers will be offered a job. That is significantly less compared to 1976 when 35% were needed. It is not only about unemployment. Unemployed young men are more likely to do criminal acts and avoid parenting responsibilities. Adolescents are most naive and violent. Those younger than 24 are responsible for half of crimes regarding violence in the USA, and those younger than 18 for one fourth. The numbers are similar for most developed countries in the world [14].

The globalization influences the movement of capital to states with cheap labour force, because the profits in those countries are bigger. The result of that capital movement is increase of unemployment rate in developed Euro-Atlantic zone countries, as well as the increase of other related social problems. Because of that their citizens need to compensate

advantages of eastern countries in cheap labour force by better education.

The quantified value of the variable "Globalization" for 2009 is 32.

## 3. Quantification of The Model of Intelligence And Memorizing from Conception Until A Child Starts to Walk

Evaluation of the model variables, synergic effect of the following scientific aspects will be taken into account:

- scientific theoretical aspects of some model variables
- value and meaning of the model variables in the period analysed in the research, i.e. from 2009 till 2020
- expected variable values in 2015, and
- expected variable values in 2020

The information model of intelligence and information memorizing until a child starts to walk for the period from 2009 till 2020 will be developed after the model variables are set:

1. A mother's health before pregnancy, during pregnancy and while breast-feeding;
2. Nutrition;
3. Strengthening of the senses: sight, hearing, touch, taste and scent;
4. Speech;
5. Standard;
6. Physical activity;
7. Addiction
8. Informatization;
9. Globalization.

The starting point is the statement that the development of intelligence and information memorizing are affected by "n" interdependent elements. The value of a certain variable model is marked as  $y_{it}$  and  $y_{it-1}$ , of the  $i$ -th variable in the  $t$  and  $t-1$  period. The increase of the input variable  $i$  value, of the information intelligence and information memorizing model until a child starts to walk, for the period from 2009 till 2020 is defined by relation (1):

$$\Delta y_{it} = y_{it} - y_{it-1} \quad (1)$$

Indirect increase rate of the variable  $i$  in relation with variable  $j$  is defined as a relation of the input increase of the variable  $i$  of the global information intelligence and information memorizing model until a child starts to walk, for the period from 2009

till 2020.,  $\Delta y_{it}$  and the input value of the variable  $j$  in the period  $t$ , i.e.

$$r_{ijt} = \frac{\Delta y_{it}}{y_{jt}} \quad (2)$$

where:  $i, j=1, \dots, n$ , a  $y_{i,t-1} \neq 0$ .

Indirect increase rates can be expressed as a variable increase matrix of the model (3):

$$r_t = \begin{bmatrix} r_{11t} & r_{12t} & \dots & r_{1nt} \\ r_{21t} & r_{22t} & \dots & r_{2nt} \\ \dots & \dots & \dots & \dots \\ r_{n1t} & r_{n2t} & \dots & r_{mnt} \end{bmatrix} \quad (3)$$

where  $t=1, \dots, t$

Variables on the main vertical line mark the direct ( $i=j$ ), and the rest ( $i \neq j$ ) the indirect increase rates. Variables in the  $i^{\text{th}}$  row mark the input increase in the variable  $i$  in relation to inputs in other variables. Variables in the  $j^{\text{th}}$  column mark the input value increase in all model variables in relation to the input of the variable  $j$  in period  $t$ . Therefore, each variable in the matrix is presented by one row and one column, with elements standing for indirect or relative increase relations. Other rows and columns match other variables of the information intelligence and information memorizing model until a child starts to walk for the period from 2009 and 2020.

Indirect increase rates can be defined with the respect to inputs of  $j^{\text{th}}$  model variable in period  $t=1$  by relation (4):

$$r'_{ijt} = \frac{\Delta y_{it}}{y_{j,t-1}} \quad (4)$$

where  $i, j = 1, \dots, n$ .

Next relation denotes connection between indirect increase rates (5):

$$r_{ijt} = \frac{r'_{ijt}}{1 + r'_{i,jt}} \quad \text{and} \quad r'_{ijt} = \frac{r_{ijt}}{1 - r'_{j,jt}} \quad (5)$$

where  $i, j = 1, \dots, n$ .

The type of matrix is defined by the external vector of model variable. The growth vector of model variables is:  $\Delta y_{it} = (\Delta y_{1t}, \dots, \Delta y_{nt})$ .

The vector of reciprocal values of the model variables is defined by the relation (6):

$$\left( \frac{1}{y_t} \right) = \left( \frac{1}{y_{1t}}, \dots, \frac{1}{y_{nt}} \right) \quad (6)$$

where  $i, j = 1, \dots, n$ , a  $y_{i,t-1} \neq 0$

The growth matrix of the information model of intelligence and memorizing from conception until a child starts to walk, for the period from 2009 until 2020 defines the external growth vector of model variables coefficients and of the vector of reciprocal values (7):

$$R_{pt} = \Delta y'_t \left( \frac{1}{y_t} \right) = \begin{bmatrix} \Delta y_{1t} \\ \Delta y_{mt} \end{bmatrix} \cdot \left( \frac{1}{y_{1t}}, \dots, \frac{1}{y_{nt}} \right) \quad (7)$$

$$R_{pt} = \begin{bmatrix} \frac{\Delta y_{1t}}{y_{1t}} & \dots & \frac{\Delta y_{1t}}{y_{nt}} \\ \dots & \dots & \dots \\ \frac{\Delta y_{mt}}{y_{1t}} & \dots & \frac{\Delta y_{mt}}{y_{nt}} \end{bmatrix} = \begin{bmatrix} r_{11t} & \dots & r_{1nt} \\ \dots & \dots & \dots \\ r_{m1t} & \dots & r_{mnt} \end{bmatrix}$$

If only direct growth rates are analysed, then the increase rate of one variable is expressed independently of the growth of other variables. When indirect growth rates are analysed, i.e. the growth of variable  $i$  to the respect of variable  $j$  ( $i, j = 1, \dots, n$ ), it is possible to define their growth structure and express all relationships through the growth matrix in whole the system.

By simultaneous presentation of direct and indirect rates, it is possible to watch simultaneously the increase rates intensity changes as well as their structural relations. Based on the hypothetically defined values of model variables, it is possible to define the variables share in realisation of intelligence and information memorizing until a child starts to walk. Variables quantified for the year 2009 are used in the model and after that the expected variable values for the year 2015 and 2020 respectively.

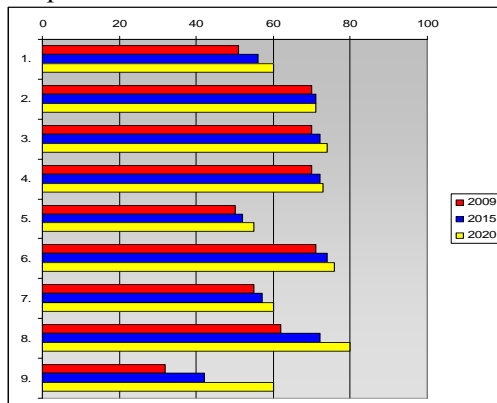
Table 1 Variable values of the model

Variable values		Inputs $y_{it}$			Incr.
		2009	2015	2020	2009/ 2020
1.	A mother's health	51	56	60	9
2.	Nutrition;	70	71	71	1
3.	Senses	70	72	74	4
4.	Speech	70	72	73	3
5.	Standard	50	52	55	5
6.	Physical activity	71	74	76	5
7.	Addiction	55	57	60	5
8.	Informatization	62	72	80	18
9.	Globalization	32	42	60	28



Based on the formerly elaborated basic research as well as on the forecast variable growth estimate (on the scale 1 to 100) variable values of the information model of intelligence and memorizing from conception until a child starts to walk for the period from 2009 until 2020 are quantified (Table 1. and Graph 1.)

Graph 1 Presentation of variables of the model



Index:

1. A mother's health before pregnancy, during pregnancy and while breast-feeding;
2. Nutrition;
3. Strengthening of the senses: sight, hearing, touch, taste and scent;
4. Speech;
5. Standard;
6. Physical activity;
7. Addiction
8. Informatization;
9. Globalization.

### 3.1. Growth matrix of the model

In the next sections the growth matrix of the model of intelligence and memorizing from conception until a child starts to walk for the period from 2009 until 2020 is presented.

The model growth vector is:

$$\Delta y_{2020} = \begin{bmatrix} 9 \\ 1 \\ 4 \\ 3 \\ 5 \\ 5 \\ 5 \\ 18 \\ 28 \end{bmatrix};$$

Reciprocal values vector of the model is:

$$\frac{1}{y_{2020}} = \left( \frac{1}{60}, \frac{1}{71}, \frac{1}{74}, \frac{1}{73}, \frac{1}{55}, \frac{1}{76}, \frac{1}{60}, \frac{1}{80}, \frac{1}{60} \right)$$

External vector product  $\Delta y'_{2020} \cdot \frac{1}{y_{2020}}$

determines growth matrix of the model of intelligence and memorizing from conception until a child starts to walk, for the period from 2009 until 2020 to the respect of existing values.

$$R_{2020} = \begin{bmatrix} 9 & 9 & 9 & 9 & 9 & 9 & 9 & 9 & 9 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \\ 4 & 4 & 4 & 4 & 4 & 4 & 4 & 4 & 4 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \\ 3 & 3 & 3 & 3 & 3 & 3 & 3 & 3 & 3 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \\ 5 & 5 & 5 & 5 & 5 & 5 & 5 & 5 & 5 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \\ 5 & 5 & 5 & 5 & 5 & 5 & 5 & 5 & 5 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \\ 18 & 18 & 18 & 18 & 18 & 18 & 18 & 18 & 18 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \\ 28 & 28 & 28 & 28 & 28 & 28 & 28 & 28 & 28 \\ 60 & 71 & 74 & 73 & 55 & 76 & 60 & 80 & 60 \end{bmatrix}$$

$$R_{2020} = \begin{bmatrix} 0,150 & 1,127 & 0,182 & 0,123 & 0,164 & 0,118 & 0,150 & 0,113 & 0,150 \\ 0,017 & 0,014 & 0,014 & 0,014 & 0,012 & 0,013 & 0,017 & 0,013 & 0,017 \\ 0,067 & 0,056 & 0,054 & 0,055 & 0,073 & 0,053 & 0,067 & 0,050 & 0,067 \\ 0,050 & 0,042 & 0,041 & 0,041 & 0,055 & 0,039 & 0,050 & 0,038 & 0,050 \\ 0,083 & 0,070 & 0,068 & 0,068 & 0,091 & 0,066 & 0,083 & 0,063 & 0,083 \\ 0,083 & 0,070 & 0,068 & 0,068 & 0,091 & 0,066 & 0,083 & 0,063 & 0,083 \\ 0,083 & 0,070 & 0,068 & 0,068 & 0,091 & 0,066 & 0,083 & 0,063 & 0,083 \\ 0,300 & 0,254 & 0,243 & 0,247 & 0,327 & 0,237 & 0,300 & 0,225 & 0,300 \\ 0,467 & 0,394 & 0,378 & 0,384 & 0,509 & 0,368 & 0,467 & 0,350 & 0,467 \end{bmatrix}$$

The growth matrix of the model of intelligence and memorizing from conception until a child starts to walk for the period from 2009 until 2020 follows:

Table 2 The growth matrix of the model.

var. (u%)	1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	<b>15,0</b>	12,7	18,2	12,3	16,4	11,8	15,0	11,3	15,0
2.	1,7	<b>1,4</b>	1,4	1,4	1,2	1,3	1,7	1,3	1,7
3.	6,7	5,6	<b>5,4</b>	5,5	7,3	5,3	6,7	5,3	6,7
4.	5,0	4,2	4,1	<b>4,1</b>	5,5	3,9	5,0	3,8	5,0
5.	8,3	7,0	6,8	6,8	<b>9,1</b>	6,6	8,3	6,3	8,3
6.	8,3	7,0	6,8	6,8	9,1	<b>6,6</b>	8,3	6,3	8,3
7.	8,3	7,0	6,8	6,8	9,1	6,6	<b>8,3</b>	6,3	8,3
8.	30,0	25,4	24,3	24,7	32,7	23,7	30,0	<b>22,5</b>	30,0
9.	46,7	39,4	37,8	38,4	50,9	36,8	46,7	35,0	<b>46,7</b>

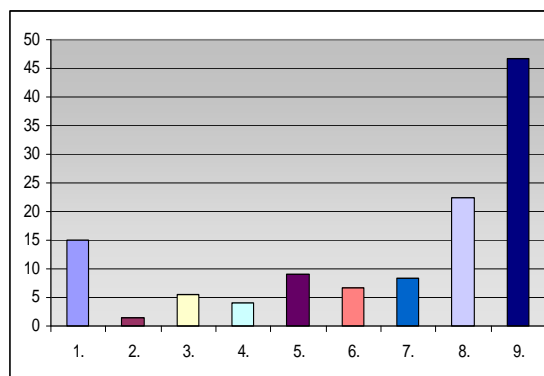
### 3. 2 Direct growth rates of variables of the information model of intelligence and memorizing from conception until a child starts to walk for the period from 2009 until 2020.

The research resulted in direct growth rates of variables of the information model of intelligence and memorizing from conception until a child starts to walk for the period from 2009 until 2020 (see Table 2. and Graph 2).

1. A mother's health before pregnancy, during pregnancy and while breast-feeding 15 %,
2. Nutrition 1,4 %,
3. Strengthening of the senses: sight, hearing, touch, taste and scent 5,4 %,
4. Speech 4,1%,
5. Standard 9,1%,
6. Physical activity 6,6%,
7. Addiction 8,3%,
8. Informatization 22,5%,
9. Globalization 46,7%.

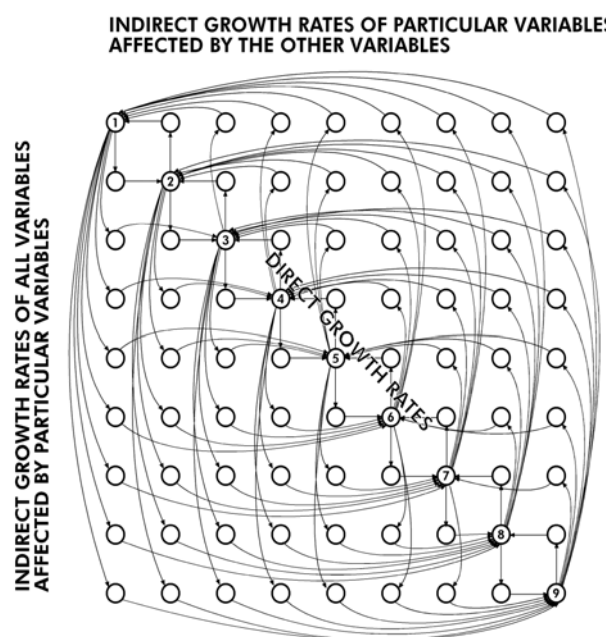
It is obvious that the highest direct growth rates of the information model of intelligence and memorizing from conception until a child starts to walk, for the period from 2009 until 2020 will have following variables: globalization variable (46,7%), informatization (22,5%), A mother's health before pregnancy, during pregnancy and while breast-feeding (15%), standard (9,1%), addictions (8,3%), physical activities (6,6%), senses of sight, hearing, touch, taste and scent (5,4%), and speech (4,1%), for all children in the life period before they start to walk, for the period before year 2020. It clearly follows that the quantification of selected variables of the global model of speed and easy learning is correct.

Graph 2. Direct growth rate of the model



It follows graphical model presentation with the diagram of direct and indirect growth rates (graph 3).

Graph 3. Direct and indirect model growth rates



Source: Authors

### 3.3. Indirect growth rates

The set model can also forecast **indirect growth rates** between particular variables of the model of intelligence and memorizing from conception until a child starts to walk for the period from 2009 until 2020. It should be stressed that there exist two different types of indirect growth rates, as shown in the graph 3:

- Indirect growth rates of particular variables, for example: variable 1, under simultaneous influence of all other variables (horizontally)



- Indirect growth rates of other variables, under influence of growth of only some particular variables, for example: of variable 1 (vertically).

### 3.3.1. Indirect growth rates of particular variables under simultaneous influence of all other model variables

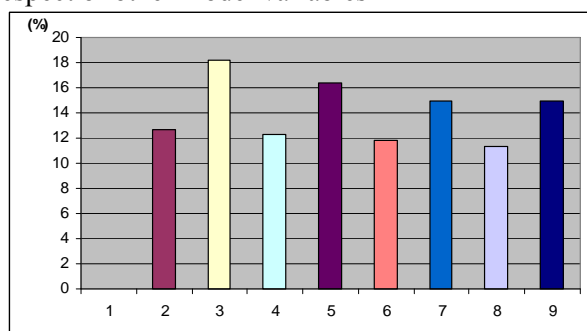
In the following section, on the example of variable "A mother's health before pregnancy, during pregnancy and while breast-feeding" under simultaneous influence of other variables, we will elaborate relations between indirect growth rates in the model of speed and easy learning 2009-2020.

By comparing indirect growth rates of the variable "A mother's health before pregnancy, during pregnancy and while breast-feeding" under simultaneous influence of other variables, model gave the following values:

1. A mother's health before pregnancy, during pregnancy and while breast-feeding -,
2. Nutrition: 12,7%,
3. Strengthening of the senses: sight, hearing, touch, taste and scent: 18,2%,
4. Speech: 12,3%,
5. Standard: 16,4%,
6. Physical activity: 11,8%,
7. Addiction: 15,0 %,
8. Informatization: 11,3 %,
9. Globalization: 15,0%.

It is obvious that the greatest influence on variable "A mother's health before pregnancy, during pregnancy and while breast-feeding" have variables of strengthening of the senses: sight, hearing, touch, taste and scent (18,2%), standard (16,4%), and globalization (15,0%).

Graph 4. Indirect growth rates of the model variable „A mother's health before pregnancy, during pregnancy and while breast-feeding" to the respect of other model variables



Source: Table 3.

In the similar way it is possible to elaborate the indirect growth rate relations for any particular variable of the model of intelligence and memorizing until a child start to walk, for period

2009 until 2020, under simultaneous influence of all other variables.

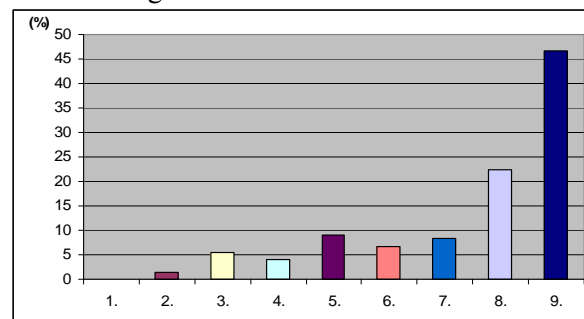
### 3.3.2 Indirect growth rates of other variables under the influence of only one particular model variable

In the following section, on the example of variable "A mother's health before pregnancy, during pregnancy and while breast-feeding" under simultaneous influence of other variables, we will elaborate relations between indirect growth rates in the global model of speed and easy learning 2009-2020. By comparing indirect growth rates of the variable "A mother's health before pregnancy, during pregnancy and while breast-feeding" under simultaneous influence of other variables, model gave the following values:

1. A mother's health before pregnancy, during pregnancy and while breast-feeding:-,
2. Nutrition: 1,7%,
3. Strengthening of the senses: sight, hearing, touch, taste and scent: 6,7%,
4. Speech: 5,0%,
5. Standard: 8,3%,
6. Physical activity: 8,3%,
7. Addiction: 8,3%,
8. Informatization: 30,0%,
9. Globalization: 46,7%,

In the indirect growth rates, where other variables are compared with the variable "A mother's health before pregnancy, during pregnancy and while breast-feeding", it can be seen that the variables: globalization (46,7%) and informatization (30,0%) will have the highest growth in the period 2009. — 2020 (Graph 5).

Graph 5. Indirect growth rates of other variables to the respect of the variable "A mother's health before pregnancy, during pregnancy and while breast-feeding"



Source: Table 3

Analysis of indirect growth rates of other variables to the respect of variable "A mother's health before pregnancy, during pregnancy and while breast-feeding" shows that for these variables

the highest indirect growth rates are forecast because of planned big increases (Table 1.). Hence follow the highest direct growth rates (Table 2.) of these variables of the global information model of intelligence and memorizing from conception until a child starts to walk for the period from 2009 until 2020.

In the similar way it is possible to elaborate the indirect growth rate relations for other variables of the information model of intelligence and memorizing until a child start to walk, for period 2009 until 2020, under simultaneous influence of any particular model variable.

#### 4. Conclusion

For the first time a "Information intelligence and information memorizing model until a child starts to walk, for the period from 2009 until 2020" has been created. A scientific research preceded: how to enable a person to by the help of their own intelligence and information memorizing capability ensure material preconditions and personal luck in the globalized world.

The basic scientific hypothesis of this paper, "Scientific findings on making the brain capable of improving intelligence and information memorizing until a child starts to walk, in order to gain BAs, MAs or PhDs, what should enable their personal improvement as well as of all the people on the Planet Earth", was proved by the help of direct and indirect increase rates of the "global information model of intelligence and information memorizing until a child starts to walk, for the period from 2009 until 2020". All additional hypotheses are proved the same way.

Mother's health and her nutrition before pregnancy, during pregnancy and while breastfeeding is very important for the capability of child's learning later in his/her life. Strengthening of the senses sets the ground for intelligence and information memorizing capability when a child becomes an adult. Children must learn to speak by hearing, imitating and practicing. Improvement in the population standard should result in better life conditions in families, and this would create preconditions for strengthening of intelligence and information memorizing until a child starts to walk. Parents' addiction, such as drugs, alcohol, cigarettes etc. results in socially problematic children, and they often have learning disabilities. Informatization helps strengthen human intelligence and information memorizing, and globalization affects capital transactions to countries with cheap man power, which causes unemployment increase in western

developed countries, and employment increase in countries with cheap man power.

The highest direct increase rates of the global information model of intelligence and information memorizing until a child starts to walk, for the period from 2009 until 2020, has the globalization (46.7%), which will together with ever growing informatization (22.5%) affect mothers' health before pregnancy, during pregnancy and while breastfeeding (15%) in the entire world. Furthermore, there is growth in the population standard (9.1%), mothers' addictions (8.3%) and physical activity with small children (6.6). Globally, strengthening of sight, hearing, touch, taste and scent will occur (5.4%) and speech improvement (4.1%) and all regarding children before they start to walk until 2020. These direct increase rates will globally affect a speeding development of states with big population such as China, India, Brazil, Mexico, etc.

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