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THE MATHEMATICAL MODEL OF HUMAN LIFE

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Abstract. *The present work includes the construction of a schematic mathematical model of “human life” from the perspective of the so-called “easy-going” and “difficult” character types. Although these terms are subjective and lack precise scientific definitions, it is considered appropriate to take these psychological types into account when constructing a mathematical model of human life. For this purpose, it is proposed to add to the function, which constitutes the mathematical model, a number or a function that will produce a shift of the entire graph of the model upward relative to the Ox axis, in the positive direction (for an individual with easy-going character), or downward, in the negative direction (for an individual with a difficult character).*

Keywords. *Mathematical modeling of human life; “easy-going” and “difficult” character types.*

Introduction.

In this study, a mathematical model is proposed that may approximately describe human life from the standpoint of an individual’s perception of life itself. The work encompasses the construction of a schematic mathematical model of “human life” from the perspective of the so-called “easy-going” and “difficult (complex)” character types.

As is known, in psychology a “easy-going character” and a “difficult character” refer to personality traits that describe an individual’s general behavior and attitude toward others. An individual with a “easy-going character” is typically friendly, sociable, balanced, and easy to communicate with. Conversely, a “difficult character” presupposes the presence of traits that complicate communication, such as obstinacy, quick-temperedness, touchiness, and conflict-proneness.

The present work constitutes a logical continuation of work [1]. It is assumed that the principal hypotheses regarding the construction of a mathematical model of human life, as set forth in [1], hold true.

In order to take into account, the mentioned type (psychotype) of individual, it is proposed to add to the function, which serves as the mathematical model [1], a number

or a function that results in a shift of the entire graph upward relative to the Ox axis (for an individual with an easy-going character) or downward (for an individual with a difficult character).

Main Text.

In [1] it is assumed that human life consists of opposing and at the same time interconnected concepts: happiness and unhappiness, love and hatred, positive and negative, etc. In [1], six hypotheses were proposed, including the following: 1. Positive and negative periods alternate with one another. 2. The amplitude of fluctuations may take different values. 3. The frequency of fluctuations may take different values. 4. The total sum of all areas bounded by the given curve and the Ox axis is equal to zero. In other words, the overall quantity of “positive” and “negative” throughout a person’s life is the same. 6. Before birth and after death, the graph of the function has no fluctuations but continues in the form of a straight-line coinciding with the Ox axis ($y=0$).

Obviously constructing a mathematical model that would precisely describe human life is impossible. Such a model is determined, for example, by its very structure, i.e., the functions it comprises and the behavior of each individual component (function) included in the model. In our view, a large number of such different models may exist, and we can only approximate the description and construction of such a model.

In [1], a mathematical model of human life was constructed, which included a periodic function $\sin(\omega \cdot t)$, a function of fluctuations amplitude $A(t)$, and a lognormal distribution function.

In the present work, it is proposed to consider the function of the mathematical model [1] that is shifted upward or downward by a value Y relative to the Oy axis.

Then the function, which serves as the mathematical model according to [1], will take the following form:

$$f(t) = y(t)A(t)\sin(\omega \cdot t) \pm Y. \quad (1)$$

Here Y is a number (constant) or some function of time $Y = Y(t)$. The value of Y or the behavior of the function $Y = Y(t)$ may be determined in each individual case

(for each person), for example, through the administration of appropriate psychological tests, experimentally by means of an expert's opinion, and so forth.

Now, with this approach, the fluctuations of function (1) will occur not around the Ox ($y = 0$), but around a conditional axis $y = Y$.

We also assume that this “shift” of the function's graph by the value $0 \leq y \leq Y$ does not occur instantaneously at the moment of a person's birth, but rather takes place gradually over some time interval $0 \leq t \leq t_1$. For this purpose, it is proposed to connect the initial point $t = 0, f(0) = 0$ and the point $t = t_1, f(t_1) = Y$ with a segment of some function (for example, a straight line). Similarly, we assume the opposite process: starting from a certain moment of time t_2 , the “shift” in Y absolute value gradually decreases, becoming zero at the end of a person's life.

These assumptions allow us to assert that hypothesis 6, which is presented in [1], is satisfied.

It should be noted that for the proposed mathematical model (1), hypothesis 4 of [1] (the hypothesis that the total sum of all areas bounded by the given curve and the Ox axis is equal to zero, i.e., the overall amount of “positive” and “negative” throughout a person's life is *the same*) will not be satisfied. In other words, hypothesis 4 of [1] will not hold with respect to the Ox ($y = 0$), but will now be approximately satisfied relative to the “conditional” axis $y = Y$.

Here we employ the term “conditional axis” because the very terms “easy-going” and “difficult” character of a person are themselves conditional, subjective, and lack precise scientific definitions.

Conclusions. Thus, in this work an approximate mathematical model of human life has been proposed from the perspective of the so-called “easy-going” and “difficult” character types. For this purpose, it has been proposed to add to the function, which constitutes the mathematical model, a number or a function that results in a shift of the entire graph of the model upward (in the positive direction) for a person with an easy-going character, or downward (in the negative direction) for a person with a difficult, complex character.

It is important to note that the terms “easy-going” and “difficult” character are subjective and lack precise scientific definitions. What may appear as a “easy-going character” to one person may be perceived as “difficult” by another, and vice versa. Furthermore, a person’s character may change over time and under the influence of life experience. Therefore, it is advisable to consider the magnitude of the “shift” $y = Y$ not as a constant (number), but as a certain function of time, the form of which we propose to leave for further research.

References:

1. Borysov Ye. Mathematical modeling of human life // SWorldJournal, Issue No. 30, Volume No. 2, 2025, p. 184-189, DOI: 10.30888/2663-5712.2025-30-02-07.

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