

IS THERE HYPERACTIVITY DISORDER AS RISK FACTOR OF POVERTY?

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Abstract

This paper focuses on the research of the risks of poverty from the perspective of individuals who, following the methodology of the American Psychiatric Association (DSM-V), show symptoms of hyperactivity. There were 193 respondents participating in the research, of which 33 had symptoms of hyperactivity, 90 respondents belonged to the control group not showing any symptoms of hyperactivity, and the remaining 70 respondents were excluded from the research as they showed mild symptoms of hyperactivity and could not be included in the tested or control group. Individuals with hyperactivity symptoms have 1.4 times higher relative risk of the absence of a financial reserve to cover costs for 3 months. Furthermore, individuals with hyperactivity were confirmed to be 3.07 times more likely to prefer the present value over the future value (but only for small amounts for a short time), implying impulsive behaviour of these individuals, which also increases the risk of poverty, especially in the context of possible negative economic shocks, such as the COVID-19 pandemic.

Keywords

Hyperactivity Disorder, Risk of Poverty, Decision-making, Financial Reserve

I. Introduction

Economic theories calculating with “Econs”² are limited to their behaviour, without them being interested in the motives leading to their decision. Therefore, economic modelling sets a number of assumptions, e.g. about preferences (e.g. the consistency of preferences) and thus creates an unrealistic model figure, which is used to demonstrate economic models. However, the average person as an individual behaves differently. Their preferences are inconsistent, and their decisions are impacted by the manner in which a task is assigned (framing), “ego exhaustion”, and many other psychological and physiological aspects.

The differences between ordinary “Humans” and “Econs” are striking, and the current polarization of society is proof of how easily the preferences of “Humans” can be influenced, while “Econs” make rational decisions at all times. Economic models work with the general population; however, in this paper, I intend to deal with a narrow group of persons who are characterised by certain qualities affecting the basic rational decision-making. These are individuals who show the symptoms of hyperactivity disorder to a lower or higher extent.

In recent years, there have been a number of experiments testing the ADHD disorder with time discounting. Due to the fact that the delay in consumption is a key psychological aspect of a number of economic issues at the micro and macro level, this paper focuses on summarizing the knowledge about ADHD in relation to intertemporal decision-making.

The paper aims to verify how hyperactivity, as one of the components of ADHD, affects consumer intertemporal decision-making and subsequently whether hyperactivity, therefore, poses a risk of poverty.

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² The concept of Econs vs. Humans was taken from Richard Thaler.

II. ADHD and Intertemporal Discounting

The ADHD disorder has two components: the attention deficit disorder (AD) and hyperactivity disorder (HD). The disorder has a prevalence of approximately 3-8% in adolescents and approximately 4% in adults (Biederman J. *et al.*, 2012). Individuals with ADHD are characterised by a lack of powerful brain functions, such as attention, working memory, etc., which are accompanied by neurological abnormalities in certain parts of the brain (Hart *et al.*, 2012; Hart *et al.*, 2013; Rubia *et al.*, 2014a). However, it is essential for the economy that individuals with the ADHD disorder (especially HD) have a disorder of the timing function and functions related to motivation which affects decision-making on rewards measured by time discounting or hazard (Noreika *et al.*, 2013; Kerr and Zelazo, 2004; Rubia *et al.*, 2009; Cools *et al.*, 2011; Robinson *et al.*, 2012; Rogers, 2011). In healthy adults, striatal 5-HT levels have been shown to modulate the selection of longer and delayed rewards (Doya, 2008; Schweighofer *et al.*, 2007; Tanaka *et al.*, 2007).

The origin of ADHD has been found in dopamine and serotonin deficiency. The neural systems involved in time discounting are highly innervated with dopaminergic neurons or regions (Norman, L. J. *et al.*, 2018). Experiments on the genetic level, as well as research using imaging and biochemical methods, unambiguously demonstrate that human behaviour, which is transmitted to everyday decision-making, is made up of multifactorial elements (congenital genetic mutations, lower hormone levels, etc.).

III. Methodology

This paper deals with the research of the behaviour of individuals without and with the symptoms of HD (rather than ADHD). An extensive research questionnaire has been developed for this purpose. An online form was used for data collection. The questionnaire was published for 3 months (03-06 / 2019). The fundamental part of the research consisted of the part monitoring the HD disorder according to the methodology for the ADHD diagnosis. This section comprised a total of 12 standardised questions according to the Diagnostic and Statistical Manual of Mental Disorders – 5th edition recommended by the American Psychiatric Association (hereinafter only as of the “**DSM-V**”).

The individuals of the test group included the respondents who would be diagnosed as having hyperactivity according to the DSM-V. In order to determine whether an individual suffers from hyperactivity, the respondent had to state out of 12 standardised symptoms according to DSM-V:

- At least five or more symptoms indicating the occasional, frequent or very frequent occurrence;
- They also occurred in an individual for more than 6 months;
- They occurred simultaneously in two or more areas of life.

It was not decisive for the test group whether they suffered from ADHD, but only whether they demonstrated the HD symptoms, and therefore comorbidities were not tested. In the classic ADHD diagnosis, it is also necessary to assess whether other comorbidities, such as schizophrenia, psychotic disease, etc., are behind the symptoms.

The control group consists of the respondents who answered in the majority that they never or very seldom suffer from the symptoms, using the 12 standardised questions. In the course of the research, a third group was identified demonstrating a milder form of hyperactivity disorder and was therefore on the edge between the control group and the test group. A total of 193 respondents from the Czech Republic participated in the research, of which 33 were in the test group, 90 in the control group and 70 in the non-decisive group. Only the respondents from the test and control groups were included in the assessment.

The subject of the experiments consists of the calculation of the relative risk (RR) or odds ratio (OR). The verification of independence in a four-field table is conducted using Fisher's exact test. In order to facilitate the interpretation, individuals who demonstrate the symptoms of the hyperactivity disorder according to the above methodology will be hereinafter referred to as the test group or individuals with hyperactivity.

The collected data were processed using the STATA statistical software (version 16).

IV. Experiments

Hypothesis 1

The first hypothesis is: "Individuals with hyperactivity are more prone to poverty than individuals without hyperactivity."

The hypothesis was tested between the control and test groups, in which it was assessed whether the net income, including social benefits per household member, is below the income poverty line. The income poverty line applicable in 2018 was used. Fisher's exact test failed to show any significant differences between the control and test groups ($p=0.385$). Therefore, the hypothesis was not confirmed.

Hypothesis 2

The second hypothesis is: "Individuals with hyperactivity more frequently do not have a financial reserve to cover their expenses for at least 3 months than individuals in the control group."

The test showed that the chance of occurrence of the reserves to cover expenses in individuals with hyperactivity is 2.7 times lower than the chance of occurrence of the reserve to cover expenses of individuals from the control group ($p=0.0153$). Individuals with hyperactivity have a 1.4 times higher the relative risk of the absence of a financial reserve to cover their expenses at least for three months.

Hypothesis 3

The third hypothesis is: "Individuals with hyperactivity run into debt more frequently than individuals without hyperactivity."

At the significance level of $p=0.05$, the Fisher's exact test failed to confirm that individuals with hyperactivity ran into debt more frequently, and therefore the third hypothesis was not confirmed ($p=0.115$).

Hypothesis 4

The fourth hypothesis is: "Individuals with hyperactivity prefer current consumption to future consumption."

This hypothesis was tested with a total of four questions standardly used in psychological studies focused on intertemporal decision-making of individuals. The questions in the questionnaire focused on the willingness to wait for a higher reward. The first question verified the subjective discount factor at a small value (CZK 100 today or CZK 110 tomorrow). The second question focused on the same amounts, yet with a longer time lag (CZK 100 today or CZK 110 in a month). The series of the other two questions changed from the previous two by only amounts (CZK 100,000 and CZK 110,000). The period remained 1 day and 1 month.

The testing results indicated the preference of the present value over the future value in individuals with hyperactivity only in the first case, i.e. with the low amount (100 CZK / 110 CZK) and the short period of 1 day.

The test confirmed that the probability of occurrence of individuals with hyperactivity who prefer CZK 100 today over CZK 110 tomorrow is 3.07 times higher than in individuals from the control group ($p=0.013$).

For the remaining three questions, the test did not show the independence of values and no significant difference between the test and control groups was demonstrated (Question 2: $RR=1.1$; $p=0.216$, Question 3: $RR=1.1$; $p=0.708$, and Question 4: $RR=1.75$; $p=0.114$).

V. Discussion

According to the research, it may be stated that individuals with hyperactivity prefer the present value to the future value, especially for small amounts and in a very short period. In the context of other results demonstrating significant differences between the test and control groups, a certain degree of differences between the two groups may be stated: individuals with hyperactivity have in particular:

- A higher risk of the absence of a financial reserve to cover expenses for 3 months;
- They prefer the present value over future value, especially for small amounts for a short time.

On the contrary, hypotheses aimed at poverty or running into debt were not confirmed. The research shows that there are no significant differences in these areas between the test and control groups.

The results correspond in some respects to already known studies on intertemporal decision-making in individuals with ADHD, e.g. Scheres et al., 2006; Scheres et al., 2008; Costa Dias et al., 2013; or Barkley et al., 2001. The most common studies are performed in children with ADHD and significantly less frequently in adults.

Due to the number of respondents in this research, it is inevitable to consider the results as preliminary; the research is thus followed by further data collection to deepen and refine the results.

VI. Conclusion

At present, the greatest risks of income poverty include the effects of the COVID-19 pandemic, which is most likely to lead to job losses, i.e. an increase in unemployment, for many months to come. In the context of these events, other risks are rather negligible. However, differences in individuals' behaviour may also be mitigated by the effects of the COVID-19 pandemic, such as the creation of a financial reserve.

The research of the respondents has shown that individuals with hyperactivity have a 1.4 times higher the relative risk of the absence of a financial reserve, and therefore any other factor (e.g. a pandemic) worsens the risk of poverty in individuals with hyperactivity more significantly than in individuals without hyperactivity who form a financial reserve more willingly. Therefore, even research into seemingly insignificant risk factors is valuable and provides some knowledge complementing the overall image of the risk of poverty.

Individuals with hyperactivity were also confirmed to be 3.07 times more likely to prefer the present value to the future value (but only for small amounts for a short time). This result confirms that hyperactive individuals show a higher rate of impulsive behaviour which has further consequences for the risk of poverty through reckless shopping. If we combine reckless, i.e. impulsive shopping with a higher risk of the absence of a financial reserve for hyperactive individuals, it may be concluded that these individuals fall more easily below the income poverty line, especially if market shocks occur.

The research tentatively confirms that some groups of the population may be further on the path to poverty than other groups, and for these reasons, continuing this research and expanding it to a larger group of respondents is important for the society.

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